SSN 0147-9725

MARYLAND BIRDLIFE

Avian studies in the Mid-Atlantic region

Bulletin of the Maryland Ornithological Society, Inc.

SPRING 2021
VOLUME 70
NUMBER 1

MARYLAND ORNITHOLOGICAL SOCIETY, INC.

4915 Greenspring Avenue, Baltimore, MD 21209
http://www.mdbirds.org

CURRENT OFFICERS – SPRING 2021

EXECUTIVE COUNCIL

President:	John McKitterick	john.mckitterick@mdbirds.org	410-997-3122
Vice-President:	Bonnie Borsa	bonnie.borsa@mdbirds.org	301-695-8214
Treasurer:	Carol Daugherty	cdaughertycpa@gmail.com	301-881-7544
Secretary:	Maryanne Dolan	maryanne.dolan@gmail.com	202-441-6676
Past-President:	Robin Todd	robintodd1948@gmail.com	410-491-5333

STATE DIRECTORS

Allegany & Garrett:	*Raquel Ketterman (vacant)	Howard:	*Mary Maxey Allen Lewis David Sandler Sherry Tomlinson
Anne Arundel:	*Chris Eberly Alan Christian Jim Collatz	Kent:	*Nancy Martin Walter Ellison
Baltimore:	*Joe Corcoran Joan Cwi Libby Errickson Mary Anne Fluke	Montgomery:	*Evelyn Ralston Woody Dubois Dave Powell Ed Vigezzi
Caroline:	*Danny Poet (vacant)	Patuxent:	*Marcia Watson Ross Geredien
Carroll:	*CJ McAuliffe Don Jewell	Talbot:	*Bettye Maki Wayne Bell
Cecil:	*Maryanne Dolan Ken Drier	Tri-County:	*Mike Walsh Mary Huebner
Frederick:	*Bonnie Borsa Tom Humphrey	Washington (Co.):	*Mark Abdy (vacant)
Harford:	*Mark Johnson Diane Jones Dennis Kirkwood		

**Denotes Chapter President*

Active Member: $20.00 plus chapter dues
Household: $25.00 plus chapter dues
Sustaining: $50.00 plus chapter dues
Life: $1000.00 (4 annual installments)
Junior (under 18): $5.00 plus chapter dues

Cover: American Kestrel (*Falco sparverius*). Male; observed hunting from power lines in a brush-hogged field; Lake Arrowhead, near Luray, Page County, Virginia; 22 January 2021; photographed by Alex Shipherd ©.

Maryland Birdlife 70(1):1

EDITOR'S NOTE

The spring 2021 issue of *Maryland Birdlife* begins with an "In Memoriam" to Patuxent Wildlife Research Center researcher Barbara A. Dowell who passed away in December 2020. The issue features extended articles on American Kestrels and on Greater White-fronted Geese. There are shorter notes on avian sunbathing and on color aberrations in birds. In addition to the 2020 May Count and the 2020 Fall Count summaries, there is also a summary of fall 2020 banding activities at the two Harford County banding stations.

Call for Potential Authors

For *Maryland Birdlife* to remain a viable publication, we need your submittals. I encourage you to publish your ornithological observations. The journal is currently soliciting articles for the fall 2021 issue. If you are apprehensive about writing or a first-time writer, I am available to help you in the process. Please e-mail your first drafts to me. Thank you for supporting the MOS journal.

Eugene J. Scarpulla
Editor
birdlife@mdbirds.org

Maryland Birdlife 70(1):2–6

In Memoriam: Barbara A. Dowell

Mark S. Johnson
3204 Bryson Court, Baldwin, Maryland 21013
marksjohnson2@gmail.com

Barbara Dowell during bird banding at a citrus grove in Belize, January 1990.

Barbara Annette White was born April 13, 1942 in Pine Bluff, Arkansas. Barbara's childhood in wildlife-rich rural Arkansas fostered her keen interest in nature, which evolved into a lifelong passion for birds. The seventh of eight children, she kept close ties to her large Southern family and cherished the times spent with them.

In every way, Barbara Dowell was a fierce advocate for the environment. She firmly believed in the natural right for all living things to exist. She took a particular interest in birds and bird banding and worked closely with Dr. Chandler S. Robbins at the United States Geological Survey, Division of

Migratory Bird Management, Patuxent Wildlife Research Center (PWRC). She began her career humbly at the then United States Fish and Wildlife Service (USF&WS) at PWRC in 1977 where she was successful in getting her foot in the door in an administrative position. That same year, she completed her undergraduate degree in zoology at the University of Maryland. By 1980, Barbara was selected to fill a Wildlife Biologist position at PWRC. She was skilled in bird banding techniques that were honed while helping with the Adventure Sanctuary banding station in Montgomery County and fully realized when banding birds over a 15-year span at multiple locations in the tropical Americas. She also was an expert in field identification.

In many ways, Barbara was Chan's logistical righthand. During research conducted while at PWRC, she coordinated the assistance of others and was responsible for finding shelter, food, and travel to remote field locations in the West Indies, Middle America, and South America. Barbara worked with Chan to understand the habitat preferences of migratory versus resident birds of the tropics where they characterized various land use practices and vegetative covers with measures of avian abundance.

Barbara Dowell and Chan Robbins birding in Guatemala, January 1992.

Using banding techniques, many tropical species were banded for the first time between 1984 and 2000 using USF&WS leg bands Many of these individuals were repeatedly recovered demonstrating that many species of migrants have the

same propensity for site fidelity in wintering habitats as many do for spring breeding areas. They also noted the presence of song for some wintering migrants.

Barbara took great pride in personally training a large number of local biologists and volunteers to assist her and Chan with collecting research data at multiple tropical study sites within eight foreign countries over 12+ years. Afterwards, some attributed her special mentorship as fostering their lifelong interest in birds and nature, and more than a few would consider Barbara to be a role model as they pursued a career involving some aspect of wildlife conservation. Some of these research sites are still active today where they are now monitoring stations. One example is the Cerro San Gil Reserve in Guatemala where the local conservation organization FUNDAECO is engaged with oversight. As a graduate student, I had the privilege of assisting her and the group in these and other areas capturing and releasing local avifauna.

Barbara also worked tirelessly to improve our understanding of the adverse impacts of habitat fragmentation on forest-nesting birds. She co-authored with Chan and Deanna Dawson an award-winning publication of a landmark study in this region which concluded that large tracts of forest-interior habitat are necessary to sustain nesting populations of many species of neotropical migrant songbirds. She and Chan also repeated Breeding Bird Census plots in Western Maryland, which Chan had completed 50 years earlier; they found disturbing declines in many species.

Chan Robbins deeply appreciated Barbara's work for him. More than a few times he remarked that she was a "life saver" for doing something he had forgot to do—or especially when she performed a task he was unaware of but subsequently realized was critical to accomplishing their work. However, on one critical occasion Barbara's help may have been literally a "life saver". This incident is described in the following quote from a tribute to Barbara from Chan's daughter Jane Robbins:

> "On a memorable day in April 2005, Barbara and Dad set out on a noon birding walk which took an unexpected turn. Dad's usually-brisk stride slackened to a snail's pace with confusing pauses. Consulting a nurse friend by phone, Barbara gently proposed a change of plans. Knowing Dad's stubbornness in such matters, she softly asked: "Chan, would you be willing to take a little ride with me? I value your amazing mind too much to risk any trauma impacting it." Dad couldn't refuse that gentle invite. The hospital staff identified and intercepted his Transient Ischemic Attack—a precursor to a stroke. A treatment regime of a blood thinner was prescribed which allowed Dad to enjoy 12 more years of vibrant life, including

speaking and writing through his late 90s. I am forever grateful to Barbara. She exemplified such gentle sensitivity with wisdom."

Barbara and her husband, Dan Boone, enjoyed spending summers at their 40-acre mountaintop farm in Garrett County where they used the old farmhouse as shelter. They recorded more than 185 bird species there and cultivated the area to attract birds.

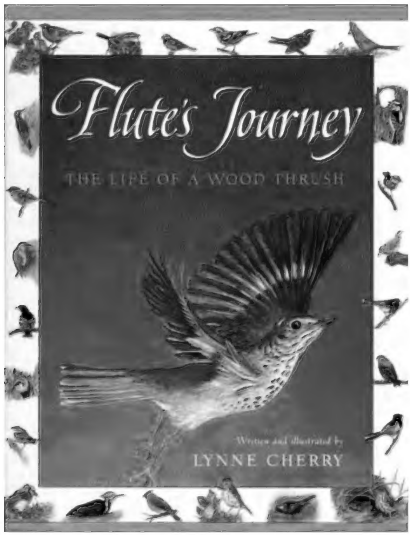
Barbara and Dan on a long boat ride back from Sani Lodge in the Ecuadorian Amazon Basin, March 2011. Photo by Kimberly Kwok.

Barbara closely assisted with Dan's lifelong environmental advocacy, and they attended countless meetings and hearings together, working with and helping to coordinate a broad coalition of conservationists and other allies in a variety of land-use and land management "battles." Most notable were their efforts to oppose the clearcutting of hardwood forests on lands managed by the Maryland Department of Natural Resources; to block the siting of industrial wind energy facilities on State Forest lands in Western Maryland; and to stop the Episcopal Diocese of Washington from obtaining permits for a large development involving the construction of over 1000 houses on 500 acres of mostly forested habitat adjoining the Belt Woods National Natural Landmark and what later became the Belt Woods Natural Environment Area, a designated Maryland State Wildland in Prince George's County.

In the years-long conservation battle to protect Belt Woods from inappropriate development, Barbara played a key role in mustering allies and focusing their

efforts for maximum political impact. One special ally was the award-winning children's book author Lynne Cherry, whom Barbara worked closely with on *Flute's Journey*, Lynne's wonderfully illustrated story about a Wood Thrush named "Flute" whose forested home in Belt Woods was being threatened by development. Lynne recently wrote that:

> "Barbara and Chan were partners in every step of my researching, writing and illustrating *Flute's Journey*. Barbara opened up a whole new world to me. She and Chan were the impetus behind my engaging kids in writing letters to the Episcopal Church to help save Chan's beloved Belt Woods, where Chan and Barbara had banded birds for so many decades. We were all so excited when the Church's development plan was halted, and became elated over the subsequent sale of the property to the State—followed by the Maryland Legislature's designation of [almost] the entire 625-acre tract as Wildland—thereby ensuring long-term protection for that remarkable stand of old-growth and its essential buffer of mature forest habitat."



Flute's Journey: The Life of a Wood Thrush. Written and illustrated by Lynne Cherry; published by Harcourt Children's Books, 1997.

Barbara passed away on December 1, 2020 at home in Bowie, Maryland, following a long struggle with cancer. She will be missed by many who knew her and, of course, the birds will miss her as well.

Acknowledgment – Thanks to Jane Fallon and Dan Boone for helpful suggestions to this memoriam.

Maryland Birdlife 70(1):7–25

Reproductive Parameters of American Kestrels (*Falco sparverius*) using Nest Boxes in the Shenandoah Valley of Virginia 2008–2020

Jill Morrow[1] and Lance Morrow

Shenandoah Valley Raptor Study Area, Timberville, Virginia 22853
[1]*saltlick2003@gmail.com*

Abstract: Our research objective was to collect baseline reproductive data on American Kestrels (*Falco sparverius*) using nest boxes in the Shenandoah Valley Raptor Study Area (SVRSA) in Virginia. From 2008 through 2020, between 4 and 87 nest boxes were available each breeding season. During this 13-year period, 608 nest attempts were made, nest box occupancy by kestrels averaged 82%, and 75% of nest attempts were successful. Clutches were initiated from 7 March through 1 July, peaking around 6 April. Clutch size averaged 4.6 (n=608 nest attempts) and, of 2,791 eggs laid, 72% hatched with 94% of hatchlings surviving to banding age. A total of 1,900 kestrel nestlings were banded in SVRSA boxes, equaling 4.2 per successful box (alternately expressed as 3.1 per nest attempt). Reproductive parameters of kestrels in SVRSA are comparable with two other nest box programs in Virginia and 11 other programs in North America. We present evidence that kestrels in the study area are non-migratory and SVRSA nest boxes sustained high occupancy and success rates for over a decade.

Keywords: American Kestrel, *Falco sparverius*, nest box, nesting success, occupancy, productivity, Virginia.

INTRODUCTION

American Kestrel (*Falco sparverius*) populations have decreased for decades in many regions of North America, especially in northeastern United States (Farmer and Smith 2009). Kestrels readily use nest boxes, enabling long-term monitoring through use of nest box programs (Katzner et al. 2005). Kestrel nest box research provides a baseline to monitor reproductive parameters, behavior, and basic demographics, and can likely provide insight into causes of regional population declines.

Smallwood (Smallwood et al. 2009) compiled results from 8 kestrel nest box studies from the 1960s to 2007 spanning a wide geographic range in North

America and encompassing populations of all migratory statuses: from entirely migratory to resident (non-migratory). All 8 nest box programs had declining occupancy after an initial increase 2–8 years after nest boxes were installed. From these nest box studies, the authors concluded a significant, widespread decline in kestrel populations was occurring without respect to migratory status. Others have noted that there were fewer pairs of kestrels breeding in boxes (i.e., declining occupancy rates) but birds who bred sustained normal reproductive parameters, i.e., clutch size and number of young produced (Bird 2009).

Several hypotheses have been proposed to explain losses of kestrels, but no single factor has been implicated (Smallwood et al. 2009, McClure et al. 2017b). Multiple contributing factors are impacting kestrel populations, e.g., habitat loss and degradation (Smallwood and Bird 2020), loss of suitable nest cavities (Smallwood and Collopy 2009), decreased survival of adults (Smallwood et al. 2009), deleterious effects of agrochemicals such as herbicides and pesticides (Walker 2003, Hallmann et al. 2014), climate change (Steenhof and Peterson 2009), human disturbance (Strasser and Heath 2013), electric shock (Morrow, L., and Morrow, J. 2018b), methane flares (Morrow, L., and Morrow, J. 2018a), and aberrant behavior (Morrow, L., and Morrow, J. 2014). Large proportions of kestrels in North America migrate south, with those in northern populations migrating further than those breeding farther south (Farmer and Smith 2009). Kestrels that breed in middle latitudes are partially migratory and those that breed farther south remain year-round (Goodrich et al. 2012). Recently, it has been suggested that more research on wintering American Kestrels' habitat requirements and survivorship may help determine whether mortality outside of the breeding season is a cause of their population decline (McClure et al. 2017b).

In the eastern United States, the long-term Breeding Bird Survey (BBS) indicates kestrels are declining 1.95% annually from 1966 to 2015 with the most recent BBS decade (2005–2015) trending slightly less severely, at -1.37% per year (Sauer et al. 2017). In Virginia, BBS indicates kestrels declined 1.48% annually between 1966 and 2015; but the most recent BBS analysis for 2005–2015 indicates kestrels are increasing at 0.3% per year.

Our objective was to extend the kestrel nest box research summarized by Smallwood et al. (2009) to document whether kestrel populations in the Shenandoah Valley of Virginia (SVRSA) would respond in a similar manner, i.e., an initial increase followed by a substantial decrease in occupancy. Here we present reproductive parameters of non-migratory American Kestrels using nest boxes over a 13-year period (2008–2020) in the SVRSA of Virginia with comparisons to two other Virginia nest box programs and 11 other programs in North America.

METHODS

The SVRSA is a trapezoidal-shaped agricultural area within northern Rockingham and southern Shenandoah Counties of Virginia. SVRSA encompasses approximately 36,000 ha (88,958 ac), geographically centered on Timberville (38°37'57.5" N, 78°46'35.4" W). The study area has a variety of land uses: row crops, livestock pastures, hayfields, commercial fruit orchards, vineyards, scattered woodlots, and wooded ridges with widely distributed residential and commercial areas. The SVRSA is approximately 19 km (12 mi) wide east to west across the Shenandoah Valley and is defined by the tree line at the base of Massanutten Mountain on the eastern side and the tree line at the base of North Mountain on the west side.

The northern and southern borders of the study area are 20 km (12.4 mi) apart. Temperature extremes average a low of -5.4 °C (22.3 °F) in January and a high of 30.6 °C (87.1 °F) in July with an average annual precipitation of 89.5 cm (35.2 in) (U.S. Climate Data 2020). Major waterways are Smith Creek, Linville Creek, and the North Fork of the Shenandoah River. The elevation, in meters above sea level, varies throughout the SVRSA; the highest point, 523 m (1,716 ft), is near the southwest corner and the lowest point, 268 m (879 ft), is near the northeast corner where the Shenandoah River exits the SVRSA. There are approximately 516 km (321 mi) of roads within the SVRSA including interstate highway I-81 that transects the SVRSA in a northeast by southwest direction.

Nest boxes were constructed of wood or plywood with internal dimensions of 22.5 x 26 cm (8.9 x 10.2 in) with an 8.26 cm (3.25 in) entrance hole. Boxes were mounted approximately 3 m (10 ft) high on poles, some with a predator guard consisting of aluminum flashing wrapped around the pole beneath the box. Bedding material (wood chips or mulch) was provided prior to March, and whenever the wood floor became visible.

Nest boxes within the SVRSA are managed for the collection of data and we endeavor to capture and mark with United States Geological Survey (USGS) bands: all breeding females (Figure 1), any breeding males that are captured opportunistically, and all nestlings (Figure 2). Adults are captured inside boxes by blocking the entrance hole and pivoting open the lid for hand capture. Nest boxes are considered available for kestrels if installed by 1 April and remain through 2 May, providing that there are no other animals using the box during that time period, primarily nesting squirrels (*Sciurus* sp.) or Eastern Screech-Owls (*Megascops asio*). Nest box sites are selected by a combination of factors (listed in decreasing order of importance): presence of kestrels, and quality habitat and accessibility from the road.

Figure 1. Breeding adult female American Kestrel (*Falco sparverius*) captured in a nest box while incubating eggs. Shenandoah Valley Raptor Study Area, 5 May 2016. Photographed by Jill Morrow.

Figure 2. Placing a USGS leg band on a young female American Kestrel. Shenandoah Valley Raptor Study Area, 3 June 2017. Photographed by Lance Morrow.

Kestrel nest boxes were installed within the SVRSA gradually, with an average increase of 7.1 boxes annually over the 13-year period. It appears the SVRSA never reached saturation for nesting kestrels, as more kestrels occupied boxes as more boxes were installed. The mean was 53 boxes over the 13-year study period, so the density of boxes averaged 679 ha (1678 ac) per box for the SVRSA (36,000 ha [88,958 ac]). Maximum nest box density occurred in 2017 and 2018; each year had 87 available nest boxes, equal to a density of one box per 413 ha (1020 ac) within the study area. However, nest boxes were not evenly distributed throughout the SVRSA and poorly producing boxes were relocated to maximize production of young kestrels.

Per the SVRSA nest box protocol, boxes were checked for adequate bedding prior to March, then rechecked for occupancy at least every 3 weeks during the breeding season. Nest boxes that were occupied by kestrels were checked a minimum of 7 times to: capture one or both parents, record clutch initiation date, numbers of eggs laid (Figure 3), hatched (Figures 4 and 5), banded, and fledged for each nest attempt. Number of eggs that hatched was recorded 6–8 days after estimated hatch date, e.g., 37–41 days after clutch initiation (depending on clutch size). During this nest check, all unhatched eggs were examined for cracks, pipping, and capping (Morrow, J., and Morrow, L. 2018/2019).

A nest box was considered occupied when it contained at least one kestrel egg. Percent occupancy was the number of nest boxes with at least one kestrel egg divided by the number of available nest boxes for that season. Percentage of eggs that hatch was the number of eggs hatched divided by the total number of eggs laid. Percentage of hatchlings that survive until banding was the number of nestlings banded divided by the total number of eggs hatched. Percentage of kestrels banded that fledged was the number of nestlings banded that were not found dead in boxes divided by the total number of nestlings banded. Nest boxes containing banded nestlings were not revisited during the same season to ascertain the number of fledging to avert premature fledging that can be caused by late nest checks (Smallwood and Bird 2020).

A nest is considered successful when at least one nestling reaches a minimum age, such as 80% of fledging age when the young are banded (Smallwood and Collopy 2009, Steenhof and Peterson 2009). A nest attempt was defined as successful in the SVRSA if at least one nestling survived to banding age (12–25 days of age), so percent success was calculated by dividing the number of nest attempts that produce at least one nestling of banding age by the total number of nesting attempts. Most nest box programs do not check that nestlings fledge after they are banded. To test the validity of this definition of nest success, we retrospectively calculated the number of banded nestlings that failed to fledge

Figure 3. Five American Kestrel eggs in a nest box. Shenandoah Valley Raptor Study Area, 17 April 2015. Photographed by Lance Morrow.

Figure 4. Female American Kestrel with young in a nest box. Shenandoah Valley Raptor Study Area, 20 May 2018. Photo credit: Lance Morrow.

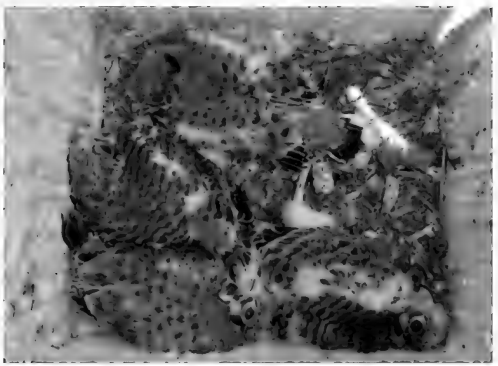


Figure 5. Two female and two male kestrel nestlings in a nest box. Shenandoah Valley Raptor Study Area, 9 June 2019. Photographed by Lance Morrow.

from boxes by counting all dead banded nestlings found inside boxes while preparing boxes in late winter/early spring for the upcoming season. From 2008–2020, a total of 455 nest boxes had been classified as successful based on at least one nestling surviving to banding age. We documented only 4 boxes (0.9%) that failed to fledge at least one banded nestling; thus, suggesting this definition of nest box success was 99.1% accurate. Out of 1,900 kestrel nestlings banded from 2008–2020, 47 individuals failed to fledge from boxes, so the failure to fledge for individual kestrels was 2.5%, inferring the remainder fledged from boxes (97.5%). A caveat is the possibility that dead fledglings were removed from boxes by scavengers, thus increasing the apparent fledging rate.

An occupied box was considered depredated if it had kestrel eggs or young but, upon next nest check, all eggs or hatchlings were gone. An occupied box was considered abandoned if eggs or nestlings were cold and no adults were present during subsequent visits. As SVRSA nest boxes were not continuously monitored, it was likely that some nest boxes contained kestrel eggs but were depredated before the box was checked. Thus, like other nest box programs, our data reflects minimum estimates of kestrel productivity (Smallwood and Collopy 2009).

Several kestrel nest boxes were usurped by Eastern Fox Squirrels (*Sciurus niger*) raising their young. To mitigate squirrel occupied boxes, where feasible, a paired box was erected on a nearby pole for kestrels' use. Kestrels begin nesting in early March in the SVRSA but, due to difficulties with the required state bird banding permit, nest boxes were not checked until 9 May 2012 so early nests that were depredated may have been missed that year.

Clutch initiation date was estimated in two ways. One method was based on the number of kestrel eggs present when the occupied box was found containing less than 5 eggs (i.e., likely not a full clutch). Clutch initiation date was backdated assuming one egg was laid every other day (Smallwood and Bird 2020). A second method was used when the first nest check revealed a full clutch of 5 or more eggs. Clutch initiation date in this case was estimated by backdating from nestling ages estimated as soon as possible after hatching, allowing for an incubation period of 30 days plus 5–9 days for clutch completion (based on the number of eggs laid at a rate of one egg every other day). For example, when a clutch of 5 eggs was found and the young counted and age estimated at 6 days old, the estimated clutch initiation was reported by backdating 6 days to hatch date, adding 9 days (time to complete a clutch of 5 eggs laying one every other day; or 7 days for a clutch of 4 eggs; and so on) plus a 30-day incubation period. Kestrel nestling ages were estimated using a photographic key (Klucsarits and Rusbuldt 2007).

To determine whether kestrels wintering inside the study area also bred in SVRSA boxes, we winter-trapped kestrels within the SVRSA and later recaptured kestrels breeding in boxes the following spring and summer. Wintering kestrels were those captured from December through February, as most kestrels have completed migration by the end of November (Smallwood and Bird 2020). Wintering kestrels were opportunistically trapped with bal-chatris baited with mice (Figure 6) (Berger and Mueller 1959). To determine whether kestrels wintering outside of the study area were immigrating to breed in SVRSA boxes, we winter-trapped kestrels outside the SVRSA (but within 100 km [62 mi] of study area borders) and later attempted to recapture them breeding in boxes the following breeding season. We also analyzed Bird Banding Laboratory records of all kestrels banded as nestlings in Virginia from 2008 through June 2020 for reencounters suggestive of seasonal migration.

Figure 6. Female American Kestrel captured on a bal-chatri trap baited with mice. Shenandoah Valley Raptor Study Area, 17 March 2019. Photographed by Terri T. Wingfield.

RESULTS

We calculated annual reproductive parameters of 608 kestrel nest attempts in SVRSA nest boxes over a 13-year period from 2008 through 2020 (Table 1). There was variability in numbers of available boxes and in measures of kestrel productivity each year. Proportion of available boxes that had at least one nesting attempt, i.e., occupancy rate, ranged from 50–93% (averaging 82%). Success varied from 50–94% (averaging 75%). Both occupancy and success varied annually but without significant trends (not shown for clarity). The mean number of eggs laid per nest attempt (clutch size) was 4.6 and varied from 3.0–4.9 (SE = 0.14). Percentage of eggs that hatched varied annually, ranging from 62% in 2012 to 95% in 2010, averaging 72%. The number of banded nestlings (n=1900) per nest attempt (n=608) averaged 3.1 (SE = 0.15). The number of banded nestlings (n=1900) per successful box (n=455) averaged 4.2 (SE = 0.08). This metric was suggestive of a slight non-significant trend upwards over 13 years.

The percentage of second nest attempts in the same box varied greatly over the study period (Table 1) ranging from 0–12% (n = 40 over 13 seasons). The majority of second nest attempts were in boxes with failed first nest attempts that were subsequently occupied by a different female, usually one who had failed elsewhere and was making her second nest attempt of the season. A minority of the second nests were attempted by the same female laying 2 distinct clutches in the same box (n=3 or 7.5% of total), with none of the latter clutches producing young.

Kestrels using SVRSA boxes initiated clutches from 7 March to 1 July (Figure 7). Pooled data for clutch initiation from 608 nest attempts in 2008–2020 showed a peak around 6 April. The later clutches initiated sporadically in May, June, and July consisted of replacement clutches after failure of first nesting attempts, delayed first clutches, and, rarely, kestrels starting second clutches after successful first clutches.

DISCUSSION

Our data are comparable with many, but not all, productivity measures previously documented by other kestrel nest box programs. We compared kestrel productivity of SVRSA nest boxes with two other Virginia nest box programs and 11 other programs throughout North America (Table 2). Results from the two other Virginia programs were from a single year (1983) and were conducted in different counties but most reproductive parameters are comparable to the SVRSA. Likewise, reproductive parameters of kestrels using boxes in 11 other North American programs were comparable to ours except mean 82% occupancy in the SVRSA is much higher than the 47% average

Table 1. American Kestrel productivity in nest boxes within the Shenandoah Valley Raptor Study Area 2008–2020.

Productivity data by year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	TOTAL
Available boxes	4	9	22	41	42	49	45	64	86	87	87	80	74	690
Boxes occupied (not including second nest attempts)	2	8	17	30	27	39	34	49	69	76	78	70	69	568
Percent occupied boxes (not including second nest attempts)	50%	89%	77%	73%	64%	80%	76%	77%	80%	87%	90%	88%	93%	82%
Total nest attempts	2	8	17	30	29	43	35	53	77	86	81	72	75	608
Successful nest attempts	1	6	16	23	19	30	28	42	48	59	63	58	62	455
Percent successful nest attempts	50%	75%	94%	77%	66%	70%	80%	79%	62%	69%	78%	81%	83%	75%
Eggs laid	6	31	77	140	130	193	162	249	339	382	384	352	346	2,791
Eggs hatched	4	22	73	98	80	143	128	194	217	249	264	260	287	2,019
Young banded	4	21	70	86	79	130	122	179	196	244	244	255	270	1,900
Young fledged	4	21	69	86	79	130	116	175	192	237	224	254	266	1,853
Second nest attempts in same box	0	0	0	0	2	4	1	4	8	10	3	2	6	40

Calculated parameters	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	MEAN	SE
Eggs laid per nest attempt	3.0	3.9	4.5	4.7	4.5	4.5	4.6	4.7	4.4	4.4	4.7	4.9	4.6	4.6	0.14
Percent eggs that hatched	67%	71%	95%	70%	62%	74%	79%	78%	64%	65%	69%	74%	83%	72%	0.03
Percent hatchlings that survived to banding age	100%	95%	96%	88%	99%	91%	95%	92%	90%	98%	92%	98%	94%	94%	0.01
Percent banded that fledged	100%	100%	99%	100%	100%	100%	95%	98%	98%	97%	92%	100%	99%	98%	0.01
Banded per nest attempt	2.0	2.6	4.1	2.9	2.7	3.0	3.5	3.4	2.5	2.8	3.0	3.5	3.6	3.1	0.15
Banded per successful nest	4.0	3.5	4.4	3.7	4.2	4.3	4.4	4.3	4.1	4.1	3.9	4.4	4.4	4.2	0.08
Percent nest attempts that are second nest attempts	na	na	na	na	7%	9%	3%	8%	10%	12%	4%	3%	8%	7%	0.01

Table 2. Comparison of reproductive parameters of American Kestrels in the SVRSA with other North American nest box programs.

Virginia nest box programs	Years active	Available nest boxes	Percent occupancy	Clutch size	Percent hatched	Percent hatched that survived to band	Percent nest attempts that were successful	Fledglings banded per nest attempt
SVRSA, Virginia (this study)	2008–2020	4–87	82	4.6	72	94	75	3.1
Prince William County, northern Virginia[a]	1983	32	81	4.0	73	87	65	2.5
Fairfax, Loudoun, and Rappahannock Counties, northern Virginia[a]	1983	73	71	3.9	91	97	86	3.4

Other North American programs	Years active	Available nest boxes	Percent occupancy	Clutch size	Percent hatched	Percent hatched that survived to band	Percent nest attempts that were successful	Fledglings banded per nest attempt
California[b]	1977–1980	65	31	4.3	67	90	69	3.1
Florida[c]	1990–1993	86–388	27	4.3	62		67	2.4
Idaho[d]	1986–2006	34–126	48	4.8			64	2.6
Iowa[e]	1988–1992	50–90	45	4.8	62	91	69	2.9
Missouri[f]	1982–1984	22–61	53	5.0	71	98	70	4.5
Pennsylvania[g]	1993–2002	112–270	86	4.6	64	94	69	2.7
Quebec[b]	2006–2017	155	12	4.0	81	81	81	3.0
West Virginia[i]	1980–1981	60–91		4.6	67	95		
Wisconsin[j]	1968–1972	50	25				67	3.2
Central Wisconsin[k]	2004–2008	58–69	60	4.7	77	90	72	2.9
Wyoming and Montana[l]	1977–1985	28–40	87	4.8	79	91	86	3.6
Averages			**47**	**4.6**	**70**	**91**	**71**	**3.1**

[a]Causey 1984, [b]Bloom and Hawks 1983, [c]Smallwood and Collopy 2009, [d]Steenhof and Peterson 2009, [e]Varland and Loughin 1993, [f]Toland and Elder 1987, [g]Katzner et al. 2005, [h]Touihri et al. 2019, [i]Wilmers 1982, [j]Hamerstrom et al. 1973, [k]Eschenbauch et al. 2009, [l]Wheeler 1992

occupancy rate of the 11 other programs (range 12–87%). SVRSA clutch size of 4.6 was the same as the average for 11 other programs. Our data, and presumably others' data, includes second clutches which are invariably smaller than first clutches (Rowe et al. 1994). Our percent hatched, percent hatched that survived to banding age, percent of nest attempts that were successful, and number of fledglings banded per nest attempt were comparable to other nest box programs. Notably, SVRSA clutch size and number of fledglings banded per nest attempt were identical to data from other nest box programs, suggesting kestrel productivity across North America is stable.

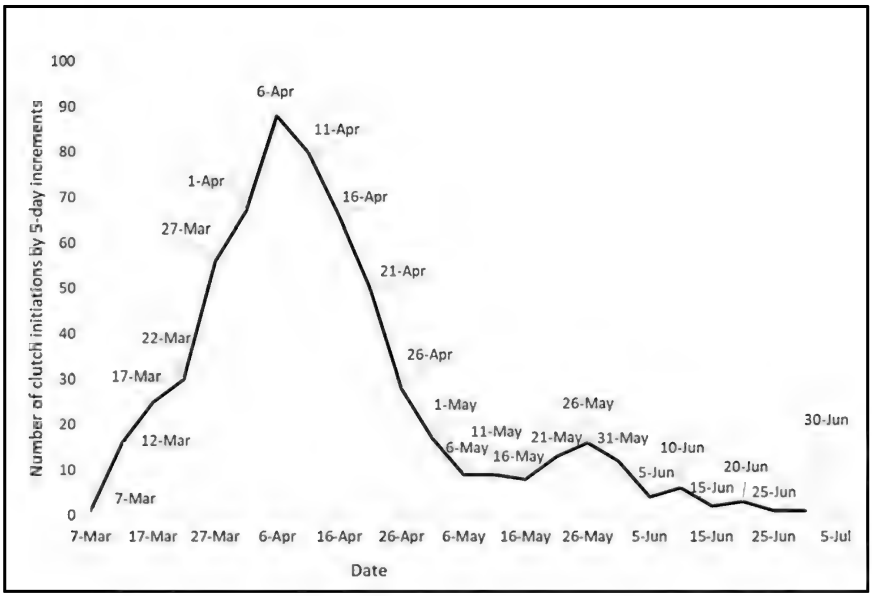


Figure 7. American Kestrel clutch initiations in Shenandoah Valley Raptor Study Area nest boxes by 5-day increments for 608 clutches initiated in 2008–2020.

We contend that the SVRSA kestrel population is mainly non-migratory based on recaptures of banded kestrels. None of the 2,139 kestrels banded in the SVRSA have been recaptured further than 100 km (62 mi) south of the study area and less than 1% were recaptured 0–100 km (0–62 mi) south of the SVRSA (Table 3). We found significant proportions of kestrels winter-trapped within the study area were recaptured breeding in SVRSA nest boxes (n=15 of 61 kestrels or 24.6%) and several kestrels banded while breeding in SVRSA boxes were later trapped during the winter (n=13 of 321 kestrels or 4.0%). Our sole foreign

recapture of a breeding female in the SVRSA had been initially banded three years earlier as a nestling in Bucks County, Pennsylvania (370 km [230 mi] northeast of SVRSA), perhaps indicating kestrels in Pennsylvania are migratory and this individual short-stopped in SVRSA (Goodrich et al. 2012). We winter-trapped 16 kestrels outside of study area borders within 100 km (62 mi) and, in spite of efforts to capture all breeding females, we recaptured none of these kestrels in nest boxes in any breeding season, suggesting kestrels wintering outside of the study area are sedentary and are not relocating to breed in our nest boxes.

Table 3. Recaptures of banded American Kestrels in and around the SVRSA. Data suggest they are non-migratory.

	Number	Percentage
Kestrels banded in the SVRSA at any time	2139	
Re-encountered > 100 km south of southern border of SVRSA at any time	0	0.0%
Re-encountered 0–100 km south of southern border of SVRSA at any time	4	0.2%
Kestrels banded in the SVRSA during winter	61	
Recaptured in SVRSA boxes during next breeding season	12	19.7%
Recaptured in SVRSA boxes during any breeding season	15	24.6%
Kestrels banded while breeding in SVRSA nest boxes	321	
Recaptured in the SVRSA during any winter season (December through February)	13	4.0%
Foreign band recaptures in SVRSA boxes during any breeding season	1	0.3%
Foreign band recaptures in SVRSA during any winter season	0	0.0%
Kestrels banded outside of the SVRSA during winter	16	
Recaptured in boxes during next breeding season	0	0.0%
Recaptured in boxes during any breeding season	0	0.0%

Compiling declining kestrel populations in several nest box programs, Smallwood et al. (2009) found initial increases in kestrel occupancy, usually peaking 1–7 years after the program was established, and peak years were followed by significant declines. Furthermore, Smallwood showed that, even as occupancy decreased, the percentage of successful boxes remained steady (averaging 84%). In contrast, kestrel occupancy in the SVRSA does not appear to have peaked or experienced decline. Kestrels breeding in nest boxes may not be representative of kestrels nesting in natural cavities. Nest boxes are a convenient, but artificial, tool to study reproductive parameters (Hamerstrom et al. 1973, McClure et al. 2017a). Although this report is a continuation of previous kestrel nest box programs reviewed by Smallwood et al. (2009), we do

not imply the reproductive parameters measured within SVRSA boxes are an index of kestrel population levels. However, it is valid to compare our data to other kestrel nest box programs.

Addition of substantial numbers of artificial nesting cavities, such as nest boxes, positively increased local kestrel populations as measured by rising box occupancy and in road surveys of wintering kestrels (Smallwood and Collopy 2009). Others have noted that occupancy of artificial sites (nest boxes) concomitantly increases with a decline in available natural sites, providing erroneous inferences regarding population trends (Hayward et al. 1992). We hypothesize this may be the case within the SVRSA because the study area is losing "natural" nest holes in large trees and abandoned structures. In addition, our removal of unproductive boxes and installation of paired boxes to ameliorate squirrel occupied boxes has likely positively skewed kestrel occupancy.

The SVRSA habitat is in constant flux with changes in agricultural practices, chiefly conversion of hayfields to row crops or vineyards, and residential and commercial development is incrementally reducing habitat suitable for kestrels and their prey. Other factors affecting kestrel productivity are prey availability, inclement weather (Dawson and Bortolotti 2000), depredation (Toland and Elder 1987), chemical contaminants (Fernie et al. 2008), and nest site disturbance (Strasser and Heath 2013).

Although squirrels usurp kestrel nest boxes and occupy them for 2–3 months (generally from late January to late April), we have found that squirrels are not a serious impediment to nesting kestrels in the SVRSA. Resident kestrels sometimes wait until squirrels leave boxes then kestrels occupy the nest box and initiate a clutch. However, we provided kestrels with paired boxes adjacent to squirrel occupied boxes so kestrels could nest on their own schedules. From 2008–2020 squirrels nested in 30 boxes and, after boxes were vacated by squirrels (29 April, on average), kestrels nested in 11 boxes (36.6%) in the same season they had been occupied by squirrels (data not shown). After examining the data, we determined that pairing boxes because of squirrels was unnecessary because kestrels are quite flexible in timing of clutch initiation. Although clutch initiation dates in the SVRSA varied slightly each year, it did not have a significant trend over the 13 years (not shown). This is a different result than a nest box study in Idaho which found kestrel clutches were initiated 21 days earlier in 2006 than they were 20 years previously; this shift was attributed to climate change (Steenhof and Peterson 2009).

European Starlings (*Sturnus vulgaris*) are ubiquitous throughout the study area and frequently nest in SVRSA kestrel boxes. They can readily remove intact kestrel eggs from nest boxes or poke holes in kestrel eggs (Wilmers 1987). We, and others (McClure et al. 2015), have observed kestrels successfully defend

their nests from starlings and have documented kestrels taking over boxes occupied by starlings. Installation of nest box cameras would enable a deeper understanding of interaction between these two cavity-nesting species.

Recently fledged kestrels may experience difficulties attaining independence. One study documented 7 of 11 radio-tracked kestrels died (63.6%) between fledging and first migration (Stupik et al. 2015). Invertebrates are the main source of food for fledgling kestrels (Varland et al. 1991) and they may be out of sync or at low levels due to climate change and/or the effects of herbicide and pesticide use that is prevalent in the SVRSA. We plan to assess prey availability and to use telemetry to track recently fledged kestrels to determine habitat usage and prey requirements to inform conservation measures.

The SVRSA kestrel population is mainly non-migratory based on data presented in Table 3 in conjunction with others' findings that most kestrels banded at latitudes below 40° N did not migrate (Goodrich et al. 2012) (the SVRSA is at 38° N). In addition, we analyzed Bird Banding Laboratory records of all kestrels banded as nestlings from 2008 through June 2020 in Virginia (n=3209) for reencounters indicating seasonal migration, i.e., kestrels recaptured south of Virginia (data not shown). Of the 36 kestrels banded as nestlings in Virginia that had a reencounter report, 30 (83.3%) were reencountered in Virginia, 5 (13.9%) were recaptured in states north of Virginia (1 each in Connecticut, New Jersey, Pennsylvania, and 2 in Maryland), and 1 (2.8%) was recaptured south of Virginia, in North Carolina during September; further implying Virginia kestrels are non-migratory. The significance of most SVRSA kestrels not migrating is that we, and others, have documented that resident kestrels initiate clutches earlier than migratory kestrels (Steenhof and Peterson 2009). Earlier clutches are larger in size (Sockman and Schwabl 2001) and an additional benefit to early nesters is that they have adequate time to attempt a second brood. Moreover, resident kestrels in the SVRSA avoid the hazards of migration and, thus, likely have a higher chance of surviving non-breeding periods (Robbins et al. 1989).

We published a winter survey of kestrels from Virginia to Texas and back through 8 states (Virginia, Tennessee, Arkansas, Texas, Louisiana, Mississippi, Alabama, and Georgia), counting kestrels along 6,583 km (4,090 mi) of roads (Morrow, L.W., and Morrow, J. 2018). Of the 249 kestrels recorded, the vast majority (98.4%) wintered in Texas. We found kestrels wintering in Texas were only observed along roads with unmowed grassy ditches, presumably because grassy ditch habitats held adequate prey. Similarly, we find kestrels wintering in the SVRSA near grassy areas with adequate cover for small mammalian prey, primarily along roadsides, hayfields, lightly grazed pastures, and fallow fields.

We agree with the conclusions of McClure et al. (2017b) that a main factor in declining kestrel populations is that too many kestrels are dying relative to the

number fledged each year. Ours, and others' nest box programs have demonstrated reproductive output is steady; thus, adult survival must be decreasing at an unsustainable rate and survival during the non-breeding season is likely poor. We posit that the non-migratory kestrels within the SVRSA have a relatively high survival rate during winter, thus maintaining high nest box occupancy rates. Future research using telemetry studies can verify the migratory status of kestrels in the SVRSA and we are compiling more data on lifetime reproductivity as it relates to overwinter survival in kestrels.

ACKNOWLEDGMENTS

We wish to thank the Bird Banding Laboratory, landowners, plus those who provided nest boxes: Rockingham Bird Club, Virginia Falconers' Association, Ralph Bolgiano, Joe Shank, John Rabbit, Doug Rogers, Charles Ziegenfus, and Valley Building Supply. And many thanks to people who helped monitor boxes and trap kestrels: Tim Rocke, Jessica Wilson (Virginia Master Naturalist Program), Ben Spory (Virginia Master Naturalist Program), Doug Rogers, Patti Reum, Rick Mazzi, Edmund Henderson, Nelson Lewis, and Charles Ziegenfus. Research was performed under Federal bird banding permit 23137 and Virginia scientific collection/bird banding permits: 030728, 035843, 041571, 047046, 053267, 058701, 064058.

LITERATURE CITED

Berger, D.D., and H.C. Mueller. 1959. The bal-chatri: A trap for the birds of prey. *Bird-Banding* 30(1):18–26.

Bird, D.M. 2009. The American Kestrel: From common to scarce? *Journal of Raptor Research* 43(4):261–262.

Bloom, P.H., and S.J. Hawks. 1983. Nest box use and reproductive biology of the American Kestrel in Lassen County, California. *Raptor Research* 17(1):9–14.

Causey, M.F. 1984. Studying kestrels. Virginia Falconers' Association. *HawkTalk* 1:6–8.

Dawson, R.D., and G.R. Bortolotti. 2000. Reproductive success of American Kestrels: The role of prey abundance and weather. *The Condor* 102(4):814–822.

Eschenbauch, J.E., E.A. Jacobs, and R.N. Rosenfield. 2009. Nest-box occupancy and reproductive performance of kestrels in central Wisconsin. *Journal of Raptor Research* 43(4):365–369.

Farmer, C.J., and J.P. Smith. 2009. Migration monitoring indicates widespread declines of American Kestrels (*Falco sparverius*) in North America. *Journal of Raptor Research* 43(4):263–273.

Fernie, K.J., J.L. Shutt, R.J. Letcher, J.I. Ritchie, K. Sullivan, and D.M. Bird. 2008. Changes in reproductive courtship behaviors of adult American Kestrels (*Falco sparverius*) exposed to environmentally relevant levels of the polybrominated diphenyl ether mixture, DE-71. *Toxicological Sciences* 102(1):171–178.

Goodrich, L.J., C.J. Farmer, D.R. Barber, and K.L. Bildstein. 2012. What banding tells us about the movement ecology of raptors. *Journal of Raptor Research* 46(1):27–35.

Hallmann, C.A., R.P.B. Foppen, C.A.M. van Turnhout, H. de Kroon, and E. Jongejans. 2014. Declines in insectivorous birds are associated with high neonicotinoid concentrations. *Nature* 511(7509):341–343.

Hamerstrom, F., F.N. Hamerstrom, and J. Hart. 1973. Nest boxes: An effective management tool for kestrels. *The Journal of Wildlife Management* 37(3):400–403.

Hayward, G.D., R.K. Steinhorst, and P.H. Hayward. 1992. Monitoring Boreal Owl populations with nest boxes: sample size and cost. *The Journal of Wildlife Management* 56(4):777–785.

Katzner, T., S. Robertson, B. Robertson, J. Klucsarits, K. McCarty, and K.L. Bildstein. 2005. Results from a long-term nest-box program for American Kestrels: Implications for improved population monitoring and conservation. *Journal of Field Ornithology* 76(3):217–226.

Klucsarits, J.R., and J.J. Rusbuldt. (K.L. Bildstein, Editor). 2007. *A Photographic Timeline of Hawk Mountain Sanctuary's American Kestrel Nestlings*. Zip Publishing, Columbus, OH. 36 pp.

McClure, C.J.W., D.M. Hilleary, and D.P. Spurling. 2015. American Kestrels actively exclude European Starlings from using a nest box. *Journal of Raptor Research* 49(2):231–233.

McClure, C.J.W., B.P. Pauli, and J.A. Heath. 2017a. Simulations reveal the power and peril of artificial breeding sites for monitoring and managing animals. *Ecological Applications* 27(4):1155–1166.

McClure, C.J.W., S.E. Schulwitz, R. van Buskirk, B.P. Pauli, and J.A. Heath. 2017b. Commentary: Research recommendations for understanding the decline of American Kestrels (*Falco sparverius*) across much of North America. *Journal of Raptor Research* 51(4):455–464.

Morrow, J., and L. Morrow. 2018/2019. Incidence of capped American Kestrel eggs (*Falco sparverius*) in a nest box program. *North American Bird Bander* 43(4)/44(1):81–85.

Morrow, L., and J. Morrow. 2014. Accumulation of organic material on the talons of American Kestrels. *North American Bird Bander* 39(3):114–116.

Morrow, L., and J. Morrow. 2018a. A burned American Kestrel breeding in Virginia's Shenandoah Valley. *Journal of Raptor Research* 52(1):100–101.

Morrow, L., and J. Morrow. 2018b. American Kestrel surviving with electric shock injuries. *Journal of Raptor Research* 52(1):102–103.

Morrow, L.W., and J. Morrow. 2018. A road survey of wintering American Kestrels from Virginia to Texas and back. *Bulletin of the Texas Ornithological Society* 51(1–2):1–4.

Robbins, C.S., J.R. Sauer, R.S. Greenberg, and S. Droege. 1989. Population declines in North American birds that migrate to the Neotropics. *Proceedings of the National Academy of Sciences* 86(19):7658–7662.

Rowe, L., D. Ludwig, and D. Schluter. 1994. Time, condition, and the seasonal decline of avian clutch size. *The American Naturalist* 143(4):698–722.

Sauer, J.R., D.K. Niven, J.E. Hines, D.J. Ziolkowski, Jr., K.L. Pardieck, J.E. Fallon, and W.A. Link. 2017. The North American Breeding Bird Survey, Results and Analyses 1966 - 2015. Version 2.07.2017. USGS Patuxent Wildlife Research Center, Laurel, MD. Available at: https://www.mbr-pwrc.usgs.gov/bbs/. Accessed 5 March 2020.

Smallwood, J.A., and D.M. Bird. 2020. American Kestrel (*Falco sparverius*), version 1.0. Birds of the World (A.F. Poole and F.B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY. Available at: https://doi.org/10.2173/bow.amekes.01. Accessed 13 August 2020.

Smallwood, J.A., and M.W. Collopy. 2009. Southeastern American Kestrels respond to an increase in the availability of nest cavities in north-central Florida. *Journal of Raptor Research* 43(4):291–300.

Smallwood, J.A., M.F. Causey, D.H. Mossop, J.R. Klucsarits, B. Robertson, S. Robertson, J. Mason, M.J. Maurer, R.J. Melvin, R.D. Dawson, G.R. Bortolotti, J.W. Parrish, Jr., T.F. Breen, and K. Boyd. 2009. Why are American Kestrel (*Falco sparverius*) populations declining in North America? Evidence from nest-box programs. *Journal of Raptor Research* 43(4):274–282.

Sockman, K.W., and H. Schwabl. 2001. Covariation of clutch size, laying date, and incubation tendency in the American Kestrel. *The Condor* 103(3):570–578.

Steenhof, K., and B.E. Peterson. 2009. American Kestrel reproduction in southwestern Idaho: Annual variation and long-term trends. *Journal of Raptor Research* 43(4):283–290.

Strasser, E.H., and J.A. Heath. 2013. Reproductive failure of a human-tolerant species, the American Kestrel, is associated with stress and human disturbance. *Journal of Applied Ecology* 50(4):912–919.

Stupik, A.E., T. Sayers, M. Huang, T.A.G. Rittenhouse, and C.D. Rittenhouse. 2015. Survival and movements of post-fledging American Kestrels hatched from nest boxes. *Northeastern Naturalist* 22(1):20–31.

Toland, B.R., and W.H. Elder. 1987. Influence of nest-box placement and density on abundance and productivity of American Kestrels in central Missouri. *The Wilson Bulletin* 99(4):712–717.

Touihri, M., M. Séguy, L. Imbeau, M.J. Mazerolle, and D.M. Bird. 2019. Effects of agricultural lands on habitat selection and breeding success of American Kestrels in a boreal context. *Agriculture, Ecosystems & Environment* 272:146–154.

U.S. Climate Data. 2020. Climate Timberville - Virginia. Version 3.0 by Your Weather Service. Available at: http://www.usclimatedata.com/climate/timberville/virginia/united-states/usva0767. Accessed 24 March 2020.

Varland, D.E., and T.M. Loughin. 1993. Reproductive success of American Kestrels nesting along an interstate highway in central Iowa. *The Wilson Bulletin* 105(3):465–474.

Varland, D.E., E.E. Klaas, and T.M. Loughin. 1991. Development of foraging behavior in the American Kestrel. *Journal of Raptor Research* 25(1):9–17.

Walker, C.H. 2003. Neurotoxic pesticides and behavioural effects upon birds. *Ecotoxicology* 12(1–4):307–316.

Wheeler, A.H. 1992. Reproductive parameters for free ranging American Kestrels (*Falco sparverius*) using nest boxes in Montana and Wyoming. *Journal of Raptor Research* 25(1):6–9.

Wilmers, T.J. 1982. Kestrel Use of Nest Boxes on Reclaimed Surface Mines in West Virginia and Pennsylvania. Master of Science thesis, West Virginia University, Morgantown, WV. 182 leaves.

Wilmers, T.J. 1987. Competition between starlings and kestrels for nest boxes: A review. Pages 156–159, In: *The Ancestral Kestrel* (Proceedings of a Symposium on Kestrel Species, St. Louis, Missouri, 1 December 1983), D.M. Bird and R. Bowman (Editors). Raptor Research Reports No. 6, Raptor Research Foundation, Inc. and Macdonald Raptor Research Centre of McGill University, Ste. Anne de Bellevue, Quebec. 178 pp.

Maryland Birdlife 70(1):26–28

Sunbathing by a Gray Catbird, *Dumetella carolinensis*

Anne Looker

13701 Sherwood Forest Drive, Silver Spring, Maryland 20904
alooker311@netzero.net

On 27 June 2020, a little while after 2:00 p.m., I observed a Gray Catbird, *Dumetella carolinensis*, sunbathing on my front deck wooden railing. I had previously read an article about a sunbathing Eastern Wood Pewee, *Contopus virens* (Watson 2017). The article's summary encouraged others to report observations of sunbathing birds and I was intrigued, so when I saw the Gray Catbird sunbathing on my deck railing, I took some photos from an upstairs window approximately 12 ft (3.7 m) from the railing (Figure 1). My home is located in a heavily wooded neighborhood in Colesville, Montgomery County, Maryland, which includes part of the Northwest Branch Stream Valley Park. The deck faces due west and receives abundant afternoon sun.

Reading the recent *Maryland Birdlife* article about sunbathing by a Blue-gray Gnatcatcher, *Polioptila caerulea*; Northern Cardinal, *Cardinalis cardinalis*; Carolina Wren, *Thryothorus ludovicianus*; and Great Crested Flycatcher, *Myiarchus crinitus* (Watson and Scarpulla 2020), I was inspired to write this brief note. I do not know how long the catbird was sunbathing prior to my noticing it. It sunbathed for approximately 90 seconds while I observed it and it sunbathed only once. The air temperature was ~32 °C (89 °F) when the photo was taken at 2:12 p.m. Although the photo is a bit fuzzy, it provided documentation for the behavior.

A check of the Gray Catbird writeup on Birds of the World (Smith et al. 2020) found "nothing reported" regarding any self-maintenance behaviors. Further searches for "Gray Catbird, sunbathing" and "Gray Catbird, sunning" using Google Scholar and Google discovered only one scientific account. Potter and Hauser (1974) reported sunbathing by adult Gray Catbirds. Additionally, there were three photos of sunbathing Gray Catbirds posted online by Finger (2010), Feinstein (2013), and Binns (2020).

Figure 1. Gray Catbird, *Dumetella carolinensis*, sunbathing on a deck railing in Colesville, Maryland, on 27 June 2020.

ACKNOWLEDGMENTS

I thank Eugene J. Scarpulla for his helpful comments in preparing this note, including performing a literature search for previous records of sunbathing behavior by Gray Catbirds. I also thank Eugene J. Scarpulla and Marcia R. Watson for encouraging me to submit this observation.

LITERATURE CITED

Binns, A. 2020. In the Backyard: Philadelphia Late-July. Notes from the Wildside. Available at: https://wildsidenaturetours.com/notes-from-the-wilds/in-the-backyard-philadelphia-late-july/. Accessed 24 November 2020.

Feinstein, J. 2013. Dust Bath, Sun Bath. Urban Wildlife Guide. Available at: http://www.urbanwildlifeguide.net/2013/04/dust-bath-sun-bath.html. Accessed 24 November 2020.

Finger, C. 2010. Random Sunning Catbird. 10,000 Birds. Available at: http://www.10000birds.com/random-sunning-catbird.htm. Accessed 24 November 2020.

Potter, E.F., and D.C. Hauser. 1974. Relationship of anting and sunbathing to molting in wild birds. *The Auk* 91(3):537–563.

Smith, R.J., M.I. Hatch, D.A. Cimprich, and F.R. Moore. 2020. Gray Catbird (*Dumetella carolinensis*), version 1.0 (text last updated 27 May 2011). In Birds of the World (A.F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY. Available at: https://doi.org/10.2173/bow.grycat.01. Accessed 23 November 2020.

Watson, M.R. 2017. Sunbathing by an Eastern Wood-Pewee, *Contopus virens*. *Maryland Birdlife* 66(2):4–8.

Watson, M.R., and E.J. Scarpulla. 2020. Sunbathing by a Blue-gray Gnatcatcher (*Polioptila caerulea*), Northern Cardinal (*Cardinalis cardinalis*), Carolina Wren (*Thryothorus ludovicianus*), and Great Crested Flycatcher (*Myiarchus crinitus*) in Bowie, Prince George's County, Maryland. *Maryland Birdlife* 69(2):13–29.

Maryland Birdlife 70(1):29–45

The Greater White-fronted Goose (*Anser albifrons*) in Maryland: Which types do we get?

Clive G. Harris

6507 75th Place, Cabin John, Maryland 20818-1407
clivegharris@yahoo.com

Abstract: The Greater White-fronted Goose (*Anser albifrons*) is a rare but increasing winter visitor to Maryland and surrounding states, usually occurring singly or in small groups. Although identification to subspecies is not necessarily easy, most recent records of this species pertain to the "Western" Greater White-fronted Goose (*A. a. gambelli*) rather than the "Greenland" Greater White-fronted Goose (*A. a. flavirostris*). This note reviews some of the main identification features of these two forms. It draws on time in the field in Ireland, Scotland, north Texas, and Indiana, which are part of the core wintering range of the two forms, as well as the examination of skins at The Natural History Museum at Tring, Hertfordshire, United Kingdom, and the Smithsonian Institution's National Museum of Natural History, Washington, District of Columbia. Some examples from our area are presented with a summary of some of the main ways to separate the two forms. As always, leaving identification at the species level is acceptable and may be the best choice for many birds.

The Greater White-fronted Goose (*Anser albifrons*) is one of only two species of goose with a circum-Arctic breeding range, sharing this distinction with the Brant (*Branta bernicla*) (Delacour 1954). In North America, the Greater White-fronted Goose breeds in the Yukon-Kuskokwim Delta in Alaska and sparsely in the taiga zone, including Cook Inlet, and from far northern Alaska across Arctic Canada to the western shores of Hudson Bay. There is a gap in breeding distribution to the west coast of Greenland. The wintering grounds span California and western Mexico, the midcontinent of the United States down to northeastern Mexico and, in the case of the Greenland population, the northern and western British Isles (Banks 2011).

Banks (2011) lists five subspecies. They are: *A. a. elgasi*, or Tule Goose, by far the largest form which has a small population and restricted breeding and wintering ranges in Alaska and California respectively; *A. a. sponsa*, a small form breeding and wintering in the Pacific Flyway (western Alaska and California/Mexico respectively); *A. a. gambelli*, comprising all birds breeding in

northern and interior Alaska across to the Hudson Bay and wintering midcontinent, east of the Rockies, including south into Mexico; *A. a. flavirostris*, breeding in Greenland and wintering in the north and west British Isles; and nominate *A. a. albifrons*, which breeds and winters in Eurasia.

This treatment has been questioned. Reeber (2016) notes the clinal variation in *albifrons*, with East Asian birds closer to North American birds in appearance than those that winter in Western Europe, as well as variability in the appearance of *gambelli*. Wilson et al. (2018) found that the Tule and Greenland forms are genetically differentiated from other forms, supporting their subspecies status. Their work did not support *sponsa* being a separate subspecies from *gambelli*. Many researchers continue to combine *sponsa* and *gambelli* under the name *A. a. frontalis*. Banding recoveries (Wilson et al. 2018) however show limited interchange of birds between the Pacific and the Central and Mississippi Flyways (*sponsa* and *gambelli* respectively per Banks [2011]). For convenience we will in this paper continue to follow Banks (2011) and use *gambelli* to refer to these midcontinent birds, which are also known to birders through the name "Western" Greater White-fronted Goose from eBird.

The population of *gambelli* was estimated to be 2.6 million in 2016, increasing at around 5.2% annually over the period 1975–2014. *Flavirostris* has very localized breeding and wintering ranges and a much smaller population, estimated at only 18,800, having declined from around 30,000 in the 1990s (Fox and Leafloor 2018).

The Occurrence of the Greater White-fronted Goose in Maryland

The Greater White-fronted Goose remains a rare visitor to Maryland, chiefly from late October through early March, although records have been increasing. The first recorded occurrence in the area was of a bird shot on the Potomac River, exact location unknown, and procured in a market in Washington, District of Columbia (DC), on 1 March 1856 (MD/DCRC 2021a, USNM 2021). This bird (USNM 607220), possibly the first specimen from Maryland, is in the Smithsonian Institution's National Museum of Natural History (USNM), Washington, DC. The only other record of a bird that century was of an immature male harvested in Grace's Quarters, Baltimore County on 12 November 1892 (Kirkwood 1895, Hampe and Kolb 1947). The species remained exceptionally rare for much of the 20th century, with only a further nine records listed by the Maryland/District of Columbia Records Committee (MD/DCRC) through the end of 1969 (MD/DCRC 2021b). The MD/DCRC (2021b) lists 39 separate observations for the 1990s, an average per year of just under 4 per year, likely reflecting both an increase in occurrence and better observer coverage.

Although there have been fluctuations from year to year, the frequency of observations has increased in recent decades. In 2010, according to eBird (2021), 11 counties had observations of this species, totaling an estimated 20 birds, well above averages for the 1990s. There were likely over 30 different individuals across the state in 2018. The current high count for the state in eBird (2021) is of a flock of 57 seen on 23 November 2017 in Garrett County.

The increasing frequency of occurrence in Maryland comes as this species winters farther north and east in the midcontinent than before. I analyzed Christmas Bird Count data (Audubon 2021) over the period 1980–2015 for the states of Indiana and Illinois. Prior to 1995, the species was seldom recorded on these counts in either state, averaging 0.001 birds per party hour. From 1996–2010, the average increased to 0.15 and 3.3 per party hour in Indiana and Illinois respectively, with an even bigger increase over 2011–2015, to 2.97 and 12.23 per party hour in those two states. Data from eBird (2021) shows a similar pattern over time.

Which subspecies do we get in Maryland? The United States Geological Survey's Bird Banding Laboratory, Patuxent Wildlife Research Center, Laurel, Maryland, has one banding return for this species in Maryland, a *gambelli* banded in Saskatchewan, Canada, and harvested in Kent County by a hunter on 10 December 1989. Banks (2012) measured the specimen from 1856 (USNM 607220) and found it to have a culmen length outside the range of *flavirostris*, and similar in size to *elgasi*. Banding returns show that birds banded in Arctic Canada have been recovered in many states in eastern North America (including Virginia, Pennsylvania, and New York) with a smaller number of recoveries of birds banded in taiga habitats in interior Alaska (Marks and Fischer 2015). There are also four banding returns of *flavirostris* from the Atlantic Flyway, all from Canada, and one resighting of a bird in Pennsylvania that had been fitted with a neck collar in Wexford, Ireland.

For much of this century, the received wisdom in Maryland, including by the MD/DCRC, was that *flavirostris* was the expected form and *gambelli* far less likely to occur. Given that *flavirostris* is a scarce and recently declining form, the correct identification to subspecies is likely to be of value. However, there has been relatively little treatment of the main ways to separate these forms in the field, and an overreliance on perceived bill color, despite cautions (e.g., Kaufman 1994), has led to many incorrect or unsubstantiated records of *flavirostris* including many observations in Maryland.

The Identification of "Western" Greater White-fronted Goose, *A. a. gambelli*, and "Greenland" Greater White-fronted Goose, *A. a. flavirostris*

The challenge in separating these forms should not be underestimated. It is complicated both by variation in these forms, particularly *gambelli*, and because the usual situation is of a lone bird in a flock of another species, usually Canada Goose (*Branta canadensis*), rather than, for example, picking out a *gambelli* in a flock of *flavirostris*.

Overall Appearance

Typical *flavirostris* are dark, almost chocolate-brown and look darker and browner than the Canada Geese with which they may be seen (Figure 1). The overall dark appearance is reinforced by the dull and indistinct fringes on the upperparts and narrow, wavy, and often broken white flank lines. The rear flank patches are often solidly dark, due to narrower and darker fringes and the tail typically has a narrow white fringe. The head and neck are very dark, and there is reduced contrast between the face and the dark fringe to the white "front" on the face. The breast is dark as well, and on most birds is similar in tone to the neck and upper breast. The belly is grayish rather than whiteish and as a result the black markings on the belly do not strongly contrast with the background color of the belly.

Gambelli is more variable in appearance than *flavirostris* reflecting its larger population and wide breeding range, with some approaching *flavirostris* in the color of the bill and darkness of the head (Figure 2). On average *gambelli* are paler and better marked birds overall. In contrast to *flavirostris*, the paler face shows more contrast with the black line at the base of the white "front," the breast often shows a strong contrast to a darker head, the belly is paler and whiter, the fringes on the upperparts and rear flanks are paler and broader, the white flank line is typically thicker, and the tail has a broader white terminal tail band. Many *gambelli* have darker heads which show less contrast with the dark border to the white "front," although still a greater contrast than most *flavirostris*. The width of the fringes on the upperparts and rear flanks also varies, being bold in some birds and narrower in others. However, on most birds a pale breast in contrast to the neck and a pale, whiteish belly is a good distinction from *flavirostris*. Some *gambelli* can be dark overall, but my experience is that they are a colder brown than *flavirostris* which is more chocolate colored.

Figure 1. "Greenland" Greater White-fronted Goose, *A. a. flavirostris*. County Wexford, Ireland, January 2017 © Clive Harris. These show the typical appearance of this form, overall dark, with narrow fringes on the upperparts, and a narrow and wavy flank line. Structure varies – the rear righthand bird has a blocky head and a thick neck whereas the two smaller birds in the middle, likely females, show smaller, rounder heads, and thinner necks.

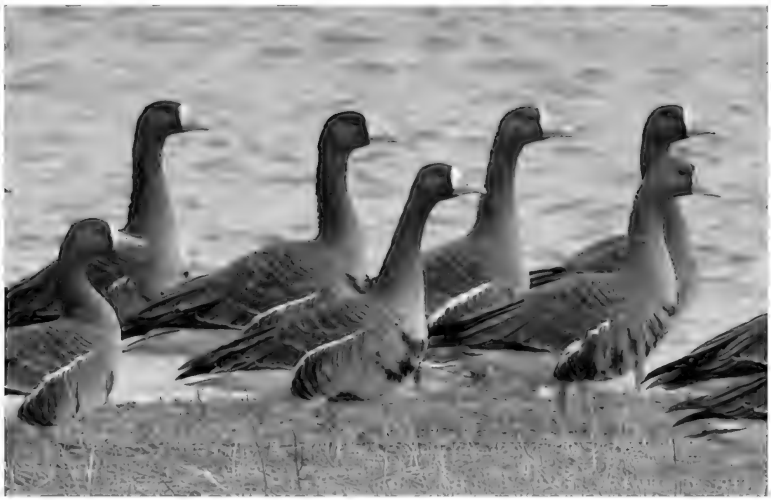


Figure 2. "Western" Greater White-fronted Goose, *A. a. gambelli*. Vermillion County, Indiana, January 2020. © Clive Harris. This shows well the variation in *gambelli*, including in head and bill color, which in these birds varies from cold pale pink to pale orange. Many flocks of *gambelli*, even small ones, contain a range of bill colors. The birds in front show pale bellies with a strong contrast with the black barring.

In flight *flavirostris* have an overall dark appearance, with a narrow white terminal fringe on the tail and on the greater secondary coverts (Figure 3). *Gambelli* have slightly broader terminal white tail bands and slightly wider white tips to the greater secondary coverts. The width of the terminal white tail band is a useful feature although there is overlap. Some *flavirostris* have tail bands as broad as the *gambelli* pictured. For the latter form, the tail band can be wider than these birds, but rarely thinner.

Figure 3. Greater White-fronted Goose in flight. Top: Two *flavirostris*, an adult on the left and an immature to the right, County Wexford, Ireland, January 2017. **Bottom:** Two adult *gambelli*. Dallas County, Texas, December 2019. © Clive Harris.

Size and Structure

Sibley (2020) notes size and structural differences as being potentially helpful in separating the two forms. While *flavirostris* is a large subspecies, the available data suggests caution in using size as an important field mark for lone birds. Ely et al. (2005), the only study assessing morphometric variation in this species on the summering grounds, found that *flavirostris* was very similar in head, bill, and tarsus measurements to *gambelli* from Nunavut. *Flavirostris* were however found to be heavier, although male *gambelli* were approximately the same mass as female *flavirostris*. The study found overall that for both subspecies, males were on average about 5% bigger in linear measurements and 10% heavier than females. Banks (2012), examining specimens of birds collected on the wintering grounds, found that *flavirostris* were marginally larger than most *gambelli*, but smaller than some large specimens from the midcontinent wintering range, which suggests that perhaps the largest Greater White-fronted Geese that might be encountered in Maryland would not be *flavirostris*.

When seen in the field, *flavirostris* often appears as a bulky and thick-necked bird with a flat crown and a blocky head. However, some birds, presumably females, have thinner necks and more rounded heads. *Gambelli* tends to be thinner necked with a more rounded head, or with the crown peaked at the rear (Figure 4). In some birds this can be very pronounced. Some *gambelli*—presumably males—have larger heads and thicker necks. Structure is helpful but needs to be used as one of several factors in establishing the identification to subspecies.

Bill Color

Bill color can be somewhat helpful but must be used with caution and has probably been the most misused field characteristic (Kaufman 1994). In adult *flavirostris*, the bill varies from pale orange to brighter orange, often with a very slight contrast to the color of the feet (Figure 5). Some *flavirostris* can have pink bills, although this is rare. The bill color of *gambelli* varies from pale pink to pale orange, overlapping with *flavirostris*. In bright sunny conditions, the pale orange can look bright orange and the same color as the legs.

Figure 4. "Western" Greater White-fronted Goose *A. a. gambelli*. Dallas County, Texas, December 2019. © Clive Harris. The birds in the front at left and right have larger heads with a flatter crown, and thicker necks than the other birds in the photo. All birds have fairly broad white flank stripes, white and prominent scapular fringes, and quite broad white terminal edges to the tail. Note the variation in bill color, with some birds showing little contrast with the feet.

Figure 5. Greater White-fronted Goose. Left: The bird has a pale pinkish-orange bill with strong contrast to the feet. It is otherwise a typical *flavirostris*, showing dark overall coloration including the belly, narrow and broken flank stripe, and dull and narrow fringes on the upperparts. County Wexford, Ireland, January 2017. **Right:** Some *gambelli* can show bright orange bills in strong sunlight. Vermillion County, Indiana, January 2020. © Clive Harris.

Bill Shape

Bill shape can be one of the most useful field characteristics for some birds (Millington 2008) (Figure 6). *Gambelli* can have a distinctive bill shape of a concave culmen with a long thin parallel distal end to the bill. This is a bill shape not seen in *flavirostris* and is diagnostic. Many *gambelli* do not show this, though they may show a subtly concave bill shape. The bill shape in *flavirostris* is also variable. In many birds, it looks heavy and wedge-shaped and in some, the upper culmen seems to have a slight convex bulge. The slight bulge at the tip of the lower mandible is often larger and more prominent than is the case on *gambelli*. Others have longer-looking bills but they lack the concave shape seen in many *gambelli* and the thin, parallel-edged distal end. In terms of overall length, Ely et al. (2005) found that populations of *gambelli* from the Northwest Territories and western Nunavut averaged longer in culmen length than *flavirostris*, though there was overlap and the differences were not large, and males had longer bills than females. Length of the bill therefore is not a useful distinction.

Extent of Black Markings on the Underparts

Flocks of *flavirostris* often contain birds with very extensive black barring on the breast and belly but many *flavirostris* have limited markings and some *gambelli* can have extensive black underneath. Probably more helpful is the extent of black markings in the rear belly and towards the vent (Sibley 2020). I examined skins of *flavirostris* at The Natural History Museum at Tring (NHMT), Hertfordshire, United Kingdom, and skins of *gambelli* at the USNM and categorized them into three groups based on the extension of the black markings relative to the end of the dark flank marks. As can be seen in Table 1, in nearly all *flavirostris*, the black markings extend to at least level with the end of the dark flank marks, and in nearly half of skins examined, well past it. In *gambelli* almost half the skins had black markings end short of the end of the dark flank marks. However, it is worth noting this is not diagnostic. Some *gambelli* have black markings well into the white vent, and some *flavirostris* do not.

Table 1. Assessment of the extent of black markings on underparts.

	A. a. flavirostris		*A. a. gambelli*	
Extent of black markings	**Number**	**Percentage**	**Number**	**Percentage**
Ends short of the end of dark flank marks	4	8%	11	48%
Ends level with the end of dark flank marks	25	47%	8	35%
Ends past the end of dark flank marks	24	45%	4	17%
Total	53	100%	23	100%

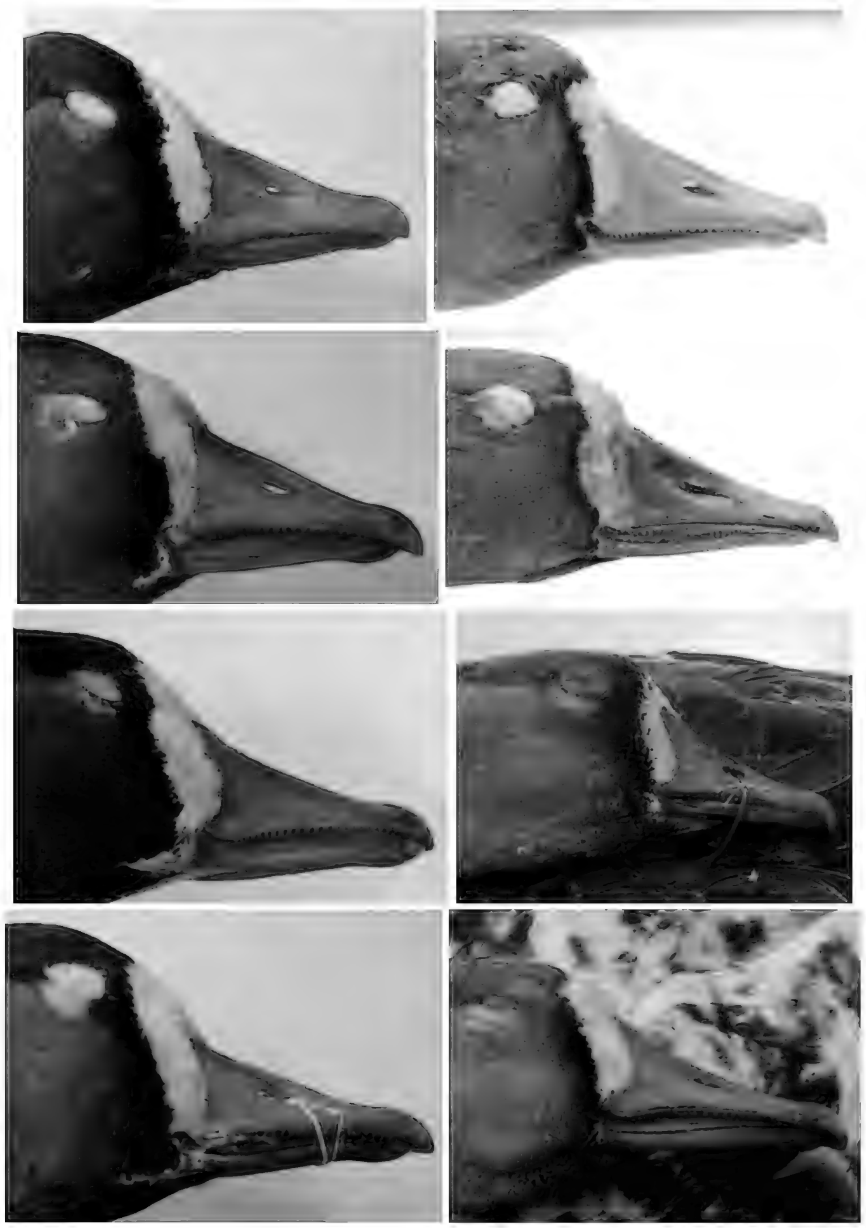


Figure 6. Comparison of bill shapes. Left: *A. a. flavirostris*, NHMT. **Right:** *A. a. gambelli*, **top:** NHMT; **row 2:** USNM 299571, male, Old Crow River, Yukon, Canada, 4 July 1926 (USNM 2021); **row 3:** NHMT; **bottom:** USNM 88973, male, Point Barrow, Alaska, 30 May 1882 (USNM 2021). © Clive Harris.

Immature Birds

Immature birds are harder to separate. In both *gambelli* and *flavirostris*, many immatures have developed a small white front by January through the preformative molt, although this is smaller and more ragged than in adults. Other pointers to age them as immatures are the rounded shape of the juvenile wing coverts as well as the messier looking flanks where the new formative feathers look much darker compared to the retained juvenile belly. Many immature *gambelli* show bright orange bills well into midwinter, although the number of immatures with pink bills is about the same in my experience. *Flavirostris* have bright orange bills; I am not aware of immatures of this form with pink bills. Immature *flavirostris* are, like adults, overall dark with dull and indistinct fringes on the upperparts, a narrow, wavy, and often broken white flank line, and a narrow white terminal tail band. Darker formative flank feathers contrast with the paler juvenile belly feathers. Like adults, immature *flavirostris* usually have grey bellies, but occasionally some have paler bellies. Both show a broad dark crown and dark hind neck. Structural differences can be used with caution, though immatures may not have developed an adult bill shape in early winter.

Summary and the Status of *A. a. gambelli* and *A. a. flavirostris* in Maryland

As noted above, the separation of these two forms might not be straightforward (summarized in Table 2) and can require good documentation. My assessment is that there are few well-documented examples of *flavirostris* in Maryland, and that most recent birds are clearly *gambelli* (Figures 7, 8, 9, and 10). The relative numbers of these two forms in our area might have changed over time. The population of *gambelli*, along with most other Arctic geese, is expanding, as noted earlier, and over the recent past there have been increases in Ross's and Cackling Geese observations in Maryland, as well. In contrast, *flavirostris* populations were 50% higher in the 1990s than they are now (Fox and Leafloor 2018).

In contrast, there are quite a few observations on eBird of typical *flavirostris* from coastal New York and New England. Perhaps not coincidentally, this matches the wintering grounds of the Canada Geese that breed in Greenland. Stroud et al. (2018) demonstrate that the interior Canada Geese that breed in central west Greenland have a winter distribution largely centered on Massachusetts, Connecticut, and especially Long Island, New York. There are some records of this population from Delaware and Maryland (Figure 11), but these two states see a much larger number of recoveries of interior Canada Geese from Northern Quebec, which migrate over western New York and Vermont to reach our area.

Table 2. Summary of field characteristics separating "Greenland" Greater White-fronted Goose (*Anser albifrons flavirostris*) and "Western" Greater White-fronted Goose (*A. a. gambelli*).

Characteristic	*A. a. flavirostris*	*A. a. gambelli*
Overall appearance	• Overall dark and uniform, chocolate-brown with dull and indistinct fringes on upperparts and narrow, wavy, and often broken white flank lines • Rear flank patches often solidly dark • Tail typically with a narrow white fringe • Head and neck dark with reduced contrast between the face and the dark fringe to the white "front" • Breast dark and similar in tone to the neck and upper breast • Belly grayish.	• More variable than *flavirostris*, particularly on color of head and neck which can be darker on some birds and show strong contrast with the lower breast and belly • Face shows stronger contrast to dark fringe at base of white "front" • Fringes on upperparts and flank patches paler and broader than *flavirostris* • White flank and terminal band to tail variable, quite broad in many • Lower breast pale gray • Belly can be very pale in many birds
Size and structure	• Often appears bulky and thick-necked with flat crown and blocky head • Some birds, presumably ♀s, have thinner necks and more rounded heads • No difference in linear measurements with *gambelli* • Main differences sex-related: males average 5% larger, 10% heavier than females • Averages heavier than *gambelli*.	• Tend to be thinner necked, strikingly on some birds with more rounded head, or with crown peaked at rear; in some birds, can be very pronounced • Some have larger, more rectangular heads and thicker necks. • No difference in linear measurements with *flavirostris* • Main differences sex-related: males average 5% larger, 10% heavier than females
Bill color	• Pale orange to orange • No to little contrast with legs • Rarely, can have a pink bill.	• Pale pink to pale orange • Can appear bright orange in strong sunlight • Can appear same color as legs
Bill shape	• Typically, wedge-shaped • Some can look quite thick-billed • Some have slight convex shape to upper mandible • Size variable due to individual and sex-related differences	• Variable, often looks thinner • Often with concave shape to upper mandible, some with distinctive narrow, parallel-edged distal half of bill, this combination not shown by *flavirostris* • Size variable due to individual and sex-related differences
Black markings on underparts	• Black markings extend to at least end of the dark flank marks, and in many well past it; helpful but not diagnostic as some *flavirostris* have black markings short of the end of the dark flank marks • Some have very extensive and almost solid black barring underneath, more frequent than in *gambelli* but the majority of *flavirostris* do not show this.	• Many have black markings ending short of the end of the dark flank marks. Though helpful this is not diagnostic as a minority have black markings well into the white vent and past the end of the dark flank markings.

Figure 7. "Western" Greater White-fronted Goose, *A. a. gambelli*. St. Mary's County, Maryland, January 2017, © Clive Harris. The concave bill with a very thin, extended tip is diagnostic for *gambelli*. Also note the pale breast and belly, broad flank line, and white and well-defined fringes on the upperparts.

Figure 8. "Western" Greater White-fronted Goose, *A. a. gambelli*. Frederick County, Maryland, November 2014, © Clive Harris. Although identified at the time by many birders as a *flavirostris*, likely because of bill color, this bird has a pale head that strongly contrasts with the black border to the white front, broad white flank line, very pale belly, well-defined white fringes on the upperparts and no black spotting into the white vent. Every field mark points to *gambelli* and none point to *flavirostris*.

Figure 9. "Western" Greater White-fronted Goose, *A. a. gambelli*. Howard County, Maryland, January 2018, © Clive Harris. Some birds are easier to identify. This bird shows a very pale pink bill with an extended and thin outer third, and the face is relatively pale, showing good contrast with the black border to the white "front". The flank line is broad and solid and the terminal white tip to the tail is quite broad as well.

Figure 10. "Western" Greater White-fronted Geese, *A. a. gambelli*. Prince George's County, Maryland, January 2017, © Clive Harris. This group of geese have pale breasts and bellies that contrast with the darker head and neck and broad flank stripes. As is typical with *gambelli*, this group contains a range of bill colors, with the second from left having a pale pink bill.

Figure 11. Greater White-fronted Geese, *A. albifrons*. Howard County, Maryland, November 2016, © Clive Harris. The bird on the right is dark and rich brown color, has a distinctly orange bill, dull fringes on the upperparts and a thin and wavy white flank line. Overall, this fits *flavirostris*. The bird on the left has a smaller head and thinner neck. While these structural differences could be due to it being a female, it also has a pinkish-orange bill, paler plumage with more contrasting black line at the base of white front, a broader flank line, and more distinct and paler fringes on the upperparts. It is possibly a *gambelli*, although I did not identify it to subspecies.

As can be seen from the above, there is variability in the characteristics of both *gambelli* and *flavirostris* and overlap in many of these. In birds that can be seen well, a range of field marks should be used including bill color and shape, color and width of fringes on the upperparts, width of the flank line and white terminal tail band, and the color of the lower breast and belly. Caution is needed in trying to identify lone birds to subspecies and leaving at the species level may be appropriate for many birds. The possible impact of lighting conditions on field marks should be considered, particularly so when reviewing photographs.

There are several records of *flavirostris* for Maryland in eBird which are clearly not this form, and many others where it is difficult to be sure. Birders are encouraged to reassess records of Greater White-fronted Goose identified to subspecies and where possible, to thoroughly document suspected flavirostris.

ACKNOWLEDGMENTS

This note has benefited from comments from two anonymous reviewers as well as exchanges on the separation of the forms of this species with Sébastien Reeber and from discussions in the field in Wexford, Ireland, with Killian Mullarney. The cooperation of staff at The Natural History Museum at Tring, and at the Smithsonian Institution's National Museum of Natural History is

much appreciated. Chuck Carlson very kindly facilitated access to the Southside Wastewater Treatment Plant, Dallas County, Texas. Danny Bystrak provided data from the United States Geological Survey's Bird Banding Laboratory, Patuxent Wildlife Research Center, Laurel, Maryland, and Phil Davis helped with information from the Maryland Ornithological Society's Maryland/District of Columbia Records Committee files.

LITERATURE CITED

Audubon. 2021. Audubon Christmas Bird Count. Available at: https://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx. Accessed 16 September 2020.

Banks, R.C. 2011. Taxonomy of Greater White-fronted Geese (Aves: Anatidae). *Proceedings of the Biological Survey of Washington* 124(3):226–233.

Banks, R.C. 2012. Geographic Variation in Wintering Greater White-fronted Geese. *Western Birds* 43(4):201–219.

Delacour, J. 1954. *The Waterfowl of the World*, Volume 1. Country Life Limited, London, U.K. 284 pp.

eBird. 2021. eBird. Available at: https://ebird.org/home. Accessed 16 September 2020.

Ely, C.R., A.D. Fox, R.T. Alisauskas, A. Andreev, R.G. Bromley, A.G. Degtyarev, B. Ebbinge, E.N. Gurtovaya, R. Kerbes, A.V. Kondratyev, I. Kostin, A.V. Krechmar, K.E. Litvin, Y. Miyabayashi, J.H. Mooij, R.M. Oates, D.L. Orthmeyer, Y. Sabano, S.G. Simpson, D.V. Solovieva, M.A. Spindler, Ye.V. Syroechkovsky, J.Y. Takekawa, and A. Walsh. 2005. Circumpolar variation in morphological characteristics of Greater White-fronted Geese *Anser albifrons*. *Bird Study* 52(2):104–119.

Fox, A.D., and J.O. Leafloor (Editors). 2018. *A Global Audit of the Status and Trends of Arctic and Northern Hemisphere Goose Populations*. Conservation of Arctic Flora and Fauna International Secretariat, Akureyri, Iceland. 31 pp.

Hampe, I.E., and H. Kolb, H. 1947. *A Preliminary List of the birds of Maryland and the District of Columbia*. The Natural History Society of Maryland, Baltimore, MD. 80 pp.

Kaufman, K. 1994. Greenland White-fronted Geese: Over-reported? *Birding* 36(6):380–382.

Kirkwood, F.C. 1895. A list of the birds of Maryland. *Transactions of the Maryland Academy of Science* 1(New Series):241–382.

Marks, D.K., and J.B. Fischer. 2015. Midcontinent Greater White-fronted Geese in Alaska: Annual Summary of Monitoring and Research, 2014. USFWS-Migratory Bird Management, Waterfowl Survey Program, Anchorage, AK. Available at: https://www.fws.gov/r7/mbsp/mbm/waterfowl/surveys/pdf/ak_gwfg_projects.pdf. Accessed 16 September 2020.

MD/DCRC (Maryland/District of Columbia Records Committee). 2021a. MD/DCRC Database Abridged Version, District of Columbia, 29 January 2021. Available at: https://mdbirds.org/wp-content/uploads/dc-records-database.pdf. Accessed 24 February 2021.

MD/DCRC (Maryland/District of Columbia Records Committee). 2021b. MD/DCRC Database Abridged Version, Maryland, 29 January 2021. Available at: https://mdbirds.org/wp-content/uploads/md-records-database.pdf. Accessed 24 February 2021.

Reeber, S. 2016. *Waterfowl of North America, Europe, and Asia.* Princeton University Press, Princeton, NJ. 656 pp.

Sibley, D. 2020. Identification tips for Greenland Greater White-fronted Goose. Sibley Guides. Available at: https://www.sibleyguides.com/2008/11/identification-tips-for-greenland-greater-white-fronted-goose/. Accessed 16 September 2020.

Stroud, D.A., R. Cromie, O. Crowe, B. Denny, R.A. Stroud, H. Thomas, N. Tierney, A. Walsh, and A.D. Fox. 2018. Annual movements of Interior Canada Geese *Branta canadensis interior* marked in Greenland, revealed by recoveries and re-sightings during 1992–2018, *Wildfowl* 68:70–83.

USNM (United States National Museum). 2021. Search the Division of Birds Collections, Smithsonian National Museum of Natural History. Available at: https://collections.nmnh.si.edu/search/birds/. Accessed 24 February 2021.

Wilson, R.E., C.R. Ely, and S.L. Talbot. 2018. Flyway structure in the circumpolar Greater White-fronted Goose. *Ecology and Evolution* 8(16):8490–8507.

Maryland Birdlife 70(1):46–50

Female House Sparrow, *Passer domesticus*, Exhibiting the Color Aberration 'Brown'

Eugene J. Scarpulla

14207 Lakerun Court, Bowie, Maryland 20720-4861
ejscarp@comcast.net

During the week of 15 November 2020, Dean Mahlstedt of Ellicott City, Howard County, Maryland, briefly observed an unusual bird exhibiting color aberration at his feeders. The feeders were being visited by House Sparrows, *Passer domesticus*. The bird showed up again on 7 December 2020 and Mahlstedt was able to photograph it (Figures 1 and 2). He posted the photos on the Maryland & DC Birding listserv, asking for help with identification (Mahlstedt 2020). Both Kurt Schwarz and Kevin Bennett responded that the bird was indeed an aberrantly-plumaged House Sparrow.

Mahlstedt (in litt., 18 January 2021 and 28 February 2021) further stated that the House Sparrow had most recently been seen at his feeders on 15 January 2021 and on 28 February 2021 (8:44 a.m. to 8:46 a.m.) and that he had spotted the bird four times since the initial sighting. It was unknown how many times the bird had actually visited. Typically, the bird would show up at the feeders, spend a few minutes eating, and then move on.

House Sparrows exhibit one of the highest proportions of aberrantly colored individuals (van Grouw 2012b, Bidasoro et al. 2020). Many examples can be found in the literature (van Grouw 2006, 2012, 2013; Corrêa et al. 2011, 2013, 2017; Fuentes and González-Acuña 2011; Ribeiro and Gogliath 2012; Cortinas-Salazar 2014; Rodríguez-Ruiz et al. 2014; Mikula et al. 2017; Lukashik 2018; Gokulakrishnan et al. 2019; Bidasoro et al. 2020). The correct naming of color aberrations has always been a source of difficulty and confusion (van Grouw 2012a, 2012b, 2013). The appearance of color aberrations can differ drastically between species, sexes, and ages of birds, and of course, all of this is dependent on the original pigmentation of a normal colored bird of the species, which should be used for comparison to the bird in question (van Grouw 2012b).

Melanins are the main pigments that determine plumage colors. The two forms are eumelanin (black, gray, and/or dark brown) and phaeomelanin (warm reddish-brown to pale buff); both forms are present in House Sparrow plumage (van Grouw 2012b). Melanins are produced by melanin-producing cells called melanocytes that are found mainly in the skin and the feather follicles. The melanocytes produce the melanin granules and add them to the feather cells as the feathers grow (van Grouw 2013).

Figure 1. House Sparrows, *Passer domesticus*. A normal male on the left and the female with the color aberration 'brown' on the right. Ellicott City, Maryland, 7 December 2020, photographed by Dean Mahlstedt.

Figure 2. Female House Sparrow with the color aberration 'brown'. Ellicott City, Maryland, 7 December 2020, photographed by Dean Mahlstedt.

van Grouw (2012b) described the heritable color aberrations (mutations) that could be found in House Sparrows, as well as the presumably non-heritable color aberration 'progressive graying' (Table 1).

Table 1. Main color aberrations in House Sparrows, *Passer domesticus*. Adapted from van Grouw (2012b; in litt., 1 February 2021). Qualitative reduction = the number of pigment granules is unchanged but the appearance of the pigment is altered. Quantitative reduction = the number of pigment granules is reduced but the pigment is unchanged.

Color Aberration	Eumelanin Present	Phaeomelanin Present	Plumage	Feet	Bill	Eyes
'albinism'	0%	0%	all white	pink (yellow if carotenoid is present)	pink (yellow if carotenoid is present)	red
'100% leucism'	0% in plumage and skin	0% in plumage and skin	all white	pink (yellow if carotenoid is present	pink (yellow if carotenoid is present	normal
'partial leucism'	0% in some regions	0% in some regions	both all white and normal feathers	yellow	yellow	normal
OR						
'partial leucism'	0% in some regions	0% in some regions	both all white and normal feathers	normal	normal	normal
'progressive graying'	progressive loss of pigment cells due to aging	progressive loss of pigment cells due to aging	all white plumage or all-white feathers mixed randomly with normal feathers	normal	normal	normal
'brown'	qualitative reduction	100%	black becomes brown; brown becomes light brown; reddish-/yellowish-brown remains normal	almost normal	almost normal	normal
'dilution – pastel'	quantitative reduction	quantitative reduction	black and brown become silvery gray; reddish/yellowish brown becomes buff/cream	normal	normal	normal
'dilution – isabel'	quantitative reduction	100%	black and brown become silvery gray; reddish/ yellowish brown remains normal	normal	normal	normal
'ino – light'	strong qualitative reduction	strong qualitative reduction	black and brown become pale cream; reddish-/yellowish-brown becomes barely visible	yellow	yellow	pinkish
'ino – dark'	qualitative reduction	qualitative reduction	black and brown become pale brown; reddish-/yellowish-brown becomes barely visible	yellowish	yellowish	dark-pinkish
'melanism'	abnormal deposition	abnormal deposition	increase of black and/or reddish-brown	normal	normal	normal
'grizzle'	lacking in parts of the feather barbs in each feather	lacking in parts of the feather barbs in each feather	grizzled-white plumage all over	normal	normal	normal

The female House Sparrow photographed by Mahlstedt does not appear to have white feathers. This character would eliminate the color aberrations 'albinism', '100% leucism', 'partial leucism', and 'progressive graying'. The bird is not abnormally dark, thereby eliminating 'melanism', and the feathers are not grizzled in appearance, thereby eliminating 'grizzle'. The colors black and brown have not become silvery gray, thereby eliminating both 'dilution – pastel' and 'dilution – isabel'. The remaining three choices were a bit more subtle to my inexperienced eye. The female House Sparrow definitely had a yellowish color, which would seem to eliminate 'ino – light' and 'ino – dark', leaving the only choice 'brown' color aberration. For confirmation and/or correction, I contacted Hein van Grouw (Senior Curator, Bird Group, Department of Life Sciences, The Natural History Museum, Tring, Hertfordshire, England, UK) whose primary research is color aberrations in birds, especially House Sparrows and corvids. van Grouw (in litt, 19 January 2021) stated that in his opinion, the plumage color of this female House Sparrow was caused by the mutation 'brown'. The phaeomelanin (reddish-/yellowish-brown) was not affected but could look slightly lighter since the underlying eumelanin has changed color (i.e., black becoming brown, brown becoming light brown). van Grouw (in litt., 1 February 2021) further elaborated that the eumelanin that has changed in color due to the mutation 'brown' is very light sensitive and bleaches rapidly in the sunlight resulting in the plumage becoming even paler. He added that the feet and bill of female House Sparrows in winter are very pale and almost pink. Therefore, since the mutation 'brown' also slightly affects the eumelanin in the bare parts, these would appear lighter, as well.

ACKNOWLEDGMENTS

I thank Dean Mahlstedt for providing the photographs of the aberrant female House Sparrow that was observed at his feeder. I especially thank Hein van Grouw for his expert guidance on House Sparrow color aberrations and for his review of a draft of this paper.

LITERATURE CITED

Bidasoro, M., R. Haro-Gil, A. Torres-Riera. 2020. Analysis of two cases of potential plumage colour aberrations in the House Sparrow *Passer domesticus* L., 1758. *Munibe Ciencias Naturales* 68:221–228.

Corrêa, L.L.C., R.L. Balestrin, D.E. Silva, and S.V. de Oliveira. 2013. Record of leucism in *Passer domesticus* (Linnaeus, 1758), in Ponta Grossa, Paraná, Brazil. *Caderno de Pesquisa, série Biologia* 25(2):6–10.

Corrêa, L.L.C., C.d.S. Bruckmann, N. Horn, G.F. Aver, R.D.B. Dal Corno, and M.V. Petry. 2017. New records of birds with chromatic mutations, southern Brazil. *Oecologia Australis* 21(4):461–463.

Corrêa, L.L.C., D.E. Silva, A.O. Trindade, and S.V. Oliveira. 2011. Registro de leucismo em pardal, Passer domesticus (Linnaeus, 1758), para o sul do Brasil. *Biodiversidade Pampeana* 9(1):12–15.

Cortinas-Salazar, J.L., and A.J. Contreras-Balderas. 2014. Two cases of partial leucism in the House Sparrow *Passer domesticus* in two localities of Northern Mexico. *Acta Zoológica Mexicana (n.s.)*, 30(3):707–710.

Fuentes, D., and D. González-Acuña. 2011. Aberraciones cromáticas del plumaje en aves: nuevos reportes en Chile. *Boletín Chileno de Ornitología* 17(2):113–121.

Gokulakrishnan, G., C. Sivaperuman, and B.L. Narayana. 2019. First records of leucistic House Sparrows (*Passer domesticus*) in the Andaman and Nicobar Islands, India. *International Studies on Sparrows* 43:12–14.

Lukashik, Y.Y. 2018. O vstrechakh domovykh vorob'yov *Passer domesticus* s aberrantnoy okraskoy opereniya v Velikom Novgorode. *Russkiy Ornitologicheskiy Zhurnal* 27(1692): 5493–5597.

Mahlstedt, D. 2020. Bird ID Assistance. Maryland & DC Birding listserv. Available at: https://groups.google.com/g/mdbirding/c/dcYpnnhPg9k. Accessed16 January 2021.

Mikula, P., A. Čanády, and M. Hromada. 2017. Aberrant plumage colouration in birds from the collection of the Sarisske Museum Bardejov, Slovakia. *Zoology and Ecology* 27(3–4):223–227. Abstract available at: http://dx.doi.org/10.1080/21658005.2017.1353737. Accessed 18 January 2021.

Ribeiro, L.B., and M. Gogliath. 2012. Um caso de leucismo em pardal, *Passer domesticus* (Linnaeus, 1758) em uma ilha do rio São Francisco, nordeste do Brasil. *Biotemas* 25(1):187–190.

Rodríguez-Ruiz, E.R., J. Valencia-Herverth, H.A. Garza-Torres, C. Aguilar-Pérez, and L. López-Moctezuma. 2014. Leucismo parcial en el gorrión casero *Passer domesticus* (Passeriformes: Passeridae) en México. *Acta Zoológica Mexicana (n.s.)* 30(3):692–695.

van Grouw, H. 2006. Not every white bird is an albino: Sense and nonsense about colour aberrations in birds. *Dutch Birding* 28(2):79–89.

van Grouw, H. 2012a. Plumage aberrations in Australian birds: A comment on Guay et al. (2012) and Frith & Murphy (2012). *Australian Field Ornithology* 29(4):210–214.

van Grouw, H. 2012b. What colour is that sparrow? A case study: Colour aberrations in the House Sparrow *Passer domesticus*. *International Studies on Sparrows* 36:30–55.

van Grouw, H. 2013. What colour is that bird? The causes and recognition of common colour aberrations in birds. *British Birds* 106:17–29.

Maryland Birdlife 70(1):51–53

Turkey Vulture, *Cathartes aura*, Exhibiting the Color Aberration 'Brown'

Eugene J. Scarpulla

14207 Lakerun Court, Bowie, Maryland 20720-4861
ejscarp@comcast.net

The 2020 spring raptor migration report for Fort Smallwood Park, Anne Arundel County, Maryland (Ricciardi 2020), contained photographs of an aberrantly colored Turkey Vulture, *Cathartes aura*, (Figure 1) that was observed on 2–3 April 2020 by Sue Ricciardi, Dan Walker, Chris Reed, Lynn Davidson, and Hal Wierenga (Ricciardi, in litt., 6 February 2021). While I was researching color aberrations in House Sparrows, *Passer domesticus*, for an article on a bird photographed by Dean Mahlstedt at his feeder in Ellicott City, Howard County, Maryland (Scarpulla 2021), I became aware of the various types of color aberrations. While probably many people mistakenly think that there are only three color aberrations—albinism (all white plumage), leucism (partially white and partially normal plumage), and melanism (darkened plumage)—that is not the case. There are actually many color aberrations that exist (see van Grouw 2006, 2012, 2013; Scarpulla 2021 for the various aberration descriptions).

My initial thought was that the Fort Smallwood bird exhibited the color aberration 'partial leucism'. Researching further, I contacted Hein van Grouw (Senior Curator, Bird Group, Department of Life Sciences, The Natural History Museum, Tring, Hertfordshire, England, UK) who researches color aberrations in birds. He explained why the bird did not exhibit 'partial leucism' but instead exhibited the color aberration 'brown' along with extreme sunlight-bleaching (van Grouw, in litt., 2 February 2021). With the color aberration 'brown', there is a reduction in the quality of the pigment eumelanin produced and thereby, the plumage is not fully colored. Compared with a normally colored bird, a bird with the color aberration 'brown' has the same number of eumelanin granules but the quality of the granules is reduced, resulting in paler plumage (van Grouw, in litt, 4 February 2021). This results in normally black feathers becoming brown and normally brown feathers becoming light brown. The other primary pigment phaeomelanin (if present in a species) is unaffected, so the reddish-/yellowish-brown feathers remain normal (however, Turkey Vultures do not have phaeomelanin [van Grouw, in litt., 4 February 2021]). The pale feathers of the pictured vulture are not pure white but instead are a pale cream color, and the darker feathers appear to be paler than the normal plumage. Even with sunlight-bleaching, the pale feathers did not become pure white. If the bird was exhibiting 'partial leucism', the pale feathers would be pure white and the darker

Figure 1: Turkey Vulture, *Cathartes aura*, exhibiting the color aberration 'brown'. Left: dorsal view; right: ventral view. Fort Smallwood Park, 3 April 2020. Photographed by Dan Walker.

feathers would retain their normal coloration. van Grouw (in litt., 2 February 2021) further stated that the condition 'brown' is "rather common" in Turkey Vultures. For other examples of Turkey Vultures exhibiting the color aberration 'brown' with sunlight-bleaching, see Figueroa et al. (2011); and for examples exhibiting the color aberration 'partial leucism' (and possibly 'progressive graying' [the resulting effect would appear similar]), see Zeigler et al. (2017).

ACKNOWLEDGMENTS

I thank Sue Ricciardi and Dan Walker for documenting the aberrant Turkey Vulture at Fort Smallwood Park. I especially thank Hein van Grouw for his input educating me on differentiating the various color aberrations and for reviewing a draft of this paper.

LITERATURE CITED

Figueroa, J., M. Shuichi, and G. Mori. 2011. Casos de leucismo en el Gallinazo de Cabeza Roja (*Cathartes aura*) en la isla Lobos de Tierra, Perú. *Boletín informativo UNOP* 6(2):14–18.

Riccardi, S.A. 2020 spring raptor migration at Fort Smallwood Park, Anne Arundel County, Maryland. *Maryland Birdlife* 69(2):60–64.

Scarpulla, E.J. 2021. Female House Sparrow, *Passer domesticus*, exhibiting the color aberration 'brown'. *Maryland Birdlife* 70(1):46–50.

van Grouw, H. 2006. Not every white bird is an albino: Sense and nonsense about colour aberrations in birds. *Dutch Birding* 28(2):79–89.

van Grouw, H. 2012. What colour is that sparrow? A case study: Colour aberrations in the House Sparrow *Passer domesticus*. *International Studies on Sparrows* 36:30–55.

van Grouw, H. 2013. What colour is that bird? The causes and recognition of common colour aberrations in birds. *British Birds* 106:17–29.

Zeiger, J.M., J. Proctor, and S.E. Inman. 2017. Observations of leucistic Turkey Vultures (*Cathartes aura*) in Jamaica. *The Journal of Caribbean Ornithology* 30(2):128–133.

Maryland Birdlife 70(1):54–57

A Carolina Chickadee (*Poecile carolinensis*) with 'Brown' Mutation

W. Scott Young[1] and Nathan Tea[2]

[1]*11116 Pinion Court, Gaithersburg, Maryland 20878-2565*
wsyacy@verizon.net
[2]*14100 North Gate Drive, Silver Spring, Maryland 20906-2221*
snowmie700@gmail.com

A coauthor (NT) discovered a pale Carolina Chickadee (*Poecile carolinensis*) within the sunflower (*Helianthus* L. sp. [Asteraceae]) field at the Chesapeake & Ohio Canal – Sycamore Landing eBird hotspot on 2 January 2021. Initial observation (Figure 1) seemed to show, in addition to the overall paleness, a brown cap and black bib, although the right panel seems to show brown in the upper part of the bib.

Figure 1. Two initial photos of a Carolina Chickadee (*Poecile carolinensis*) showing a brown cap and partially brown bib (especially evident in the right panel). Photos by Stella Tea.

The other coauthor (WSY) visited the same location on 15 February 2021 and relocated this pale Carolina Chickadee. Photos with more even illumination indicated that the bib was similarly brown as the cap (Figure 2). All photos clearly show that the normal grey back and tail feathers are much paler, nearly white, with a hint of tan remaining.

First, we justify our identification of this bird as a Carolina Chickadee, and not a Black-capped Chickadee (*Poecile atricapillus*), based on these characteristics: the bib margin along the bottom edge is smooth, not rough, and the bird seemed

Figure 2. Carolina Chickadee with the 'brown' mutation. The bib is more clearly brown in these photos, especially in the right the panel, more closely matching the cap color. The grey feathers on the back and tail are extremely pale with some light tan remaining. Photos by WSY.

less plump and daintier, with a slightly shorter tail than one would expect with a Black-capped Chickadee.

Second, we conclude that this bird expresses the 'brown' mutation in the tyrosinase-related protein 1 gene (*TYRP1*^{b}; see below) based on the review by van Grouw (2013). This mutation leads to a reduced level of oxidation and less black eumelanin and more brown eumelanin in feathers (Krishnan 2016; see further discussion below). We are not concerned in our case with any remaining yellowish-brown to reddish-brown pheomelanins as it is not believed to be produced to any extent in this species (D'Alba et al. 2014; van Grouw, in litt.). Thus, areas normally containing high amounts of black eumelanin (i.e., cap and bib) become brown while other plumage with less eumelanin becomes very light brown or white. 'Albinism' due to the absence of functional tyrosinase would lead to a totally white bird, including the cap and bib (and pink eyes), and 'leucism' to partially or totally white plumage throughout the bird (and normal colored eyes). We also considered the 'ino' mutation. That affects the level of both melanins leading to a lighter brown cap and bib than we see here as well as a pink bill and feet which this bird does not have.

A brief search online revealed other Carolina or Black-capped Chickadees with brown caps and bibs, almost always mistakenly considered examples of 'leucism', revealing a fundamental misunderstanding of 'leucism'. An example of a 'brown' mutation is shown by Faintich (2015). 'Leucism' arises from the reduction of the migration of melanocytes from the neural crest to the skin and feather follicles. The absence of melanocytes leads to the absence of melanins in the feather which is thus white. This cannot lead to the brown color of the cap and bib nor the pale other plumage as noted above in our bird. Instead, the 'brown' mutation phenotype is known to arise from a decrease in tyrosinase

activity through an increase in *TYRP1* expression (Xu et al. 2013, Domyan et al. 2014, Wang et al. 2014) leading to a decrease in further oxidation of the brown eumelanin to black eumelanin.[3]

[3] The generation of colors in birds is immensely complex (Domyan et al. 2014, Sly 2019). For the interested reader, the process of melanin synthesis is stimulated by activation of the melanocortin-1 receptor (MC1R) by melanocortin (as well as inhibited by agouti-signaling protein that instead activates pheomelanin production). This activation leads to increased expression of the gene for the protein, microphthalmia-associated transcription factor, that regulates tyrosinase expression and is also implicated in the 'brown' mutation (Wang 2014). In addition, MC1R stimulates expression of dopachrome tautomerase (*TYRP2*) and 5,6-dihydroxyindole-2-carboxylic acid (DHICA) oxidase (*TYRP1*), necessary for eumelanin production (Galván and Solano 2016). Not only does the normal color in feathers arise from the proper generation of the melanin pigments, but also from their proper transfer within specifically-shaped melanosomes (also dependent on MC1R) from the melanocytes to the keratinocytes of the feathers. In addition, the eumelanin granules need to be properly embedded into the keratin sheets (Galván and Solano 2016, D'Alba and Shawkey 2019).

ACKNOWLEDGMENTS

We warmly thank Hein van Grouw (Senior Curator, Bird Group, Department of Life Sciences, The Natural History Museum, Tring, Hertfordshire, England, UK) for his timely and expert opinion on the color aberrations in general and of the Carolina Chickadee discussed above in particular. Francisco Solano (Professor, Universidad de Murcia, Departamento de Bioquímica y Biología Molecular B e Inmunología, Murcia, España) also provided expert insight into the 'brown' mutation. We greatly appreciate the constructive comments provided on a preliminary draft by Hein van Grouw and David D. Roberts (Montgomery Bird Club, Maryland Ornithological Society).

LITERATURE CITED

D'Alba, L., and M.D. Shawkey. 2019. Melanosomes: Biogenesis, properties, and evolution of an ancient organelle. *Physiological Reviews* 99(1):1–19.

D'Alba, L., C. Van Hemert, K.A. Spencer, B.J. Heidinger, L. Gill, N.P. Evans, P. Monaghan, C.M. Handel, and M.D. Shawkey. 2014. Melanin-based color

of plumage: Role of condition and of feathers' microstructure. *Integrative and Comparative Biology* 54(4):633–644.

Domyan, E.T., M.W. Guernsey, Z. Kronenberg, S. Krishnan, R.E. Boissy, A.I. Vickrey, C. Rodgers, P. Cassidy, S.A. Leachman, J.W. Fondon, III, M. Yandell, and M.D. Shapiro. 2014. Epistatic and combinatorial effects of pigmentary gene mutations in the domestic pigeon. *Current Biology* 24(4):459–464.

Faintich, M. 2015. Stoney Creek (Wintergreen) 3/6/15 [white and brown Carolina Chickadee]. Available at: http://www.faintich.net/Blog2015/2015_03_06.htm. Accessed on 26 February 2021.

Galván, I., and F. Solano. 2016. Bird integumentary melanins: Biosynthesis, forms, function and evolution. *International Journal of Molecular Sciences* 17(4):520.

Krishnan, S. 2016. *Genetic Basis of Melanin Pigmentation and Sexual Dichromatism in Domestic Pigeons*. Doctor of Philosophy Dissertation. University of Texas at Arlington, Arlington, TX. 100 pp.

Sly, N.D. 2019. *The Genetic Mechanisms Underlying Pigmentation and Their Evolutionary Importance in Birds*. Doctor of Philosophy Dissertation. Graduate Student Theses, Dissertations, & Professional Papers. University of Montana, Missoula, MT. 11382. 136 pp.

van Grouw, H. 2013. What colour is that bird? The causes and recognition of common colour aberrations in birds. *British Birds* 106:17–29.

Wang, Y., S.-M. Li, J. Huang, S.-Y. Chen, and Y.-P. Liu. 2014. Mutations of *TYR* and *MITF* genes are associated with plumage colour phenotypes in geese. *Asian-Australasian Journal of Animal Science* 27(6):778–783.

Xu, Y., X.-H. Zhang, and Y.-Z. Pang. 2013. Association of tyrosinase (TYR) and tyrosinase-related protein 1 (TYRP1) with melanic plumage color in Korean quails (*Coturnix coturnix*). *Asian-Australasian Journal of Animal Science* 26(11):1518–1522.

Maryland Birdlife 70(1):58–61

A Chipping Sparrow, *Spizella passerina*, with Probable 'Progressive Graying'

W. Scott Young

11116 Pinion Court, Gaithersburg, Maryland 20878-2565
wsyacy@verizon.net

I observed a pied Chipping Sparrow (CHSP), *Spizella passerina*, at my feeders on 10 April 2015, with a replacement of normally colored feathers by white ones (Figure 1). I identified it as a CHSP because it was the same, small size as the other CHSPs with which it visited the feeders. Also, the remaining color patterns of the plumage match CHSP. Upon review of Hein van Grouw's publications discussing aberrant bird coloration (van Grouw 2012, 2013), I concluded that this bird expressed one of two mutations: 'leucism' or the much more common 'progressive graying', although a conclusive determination would require observations of the bird over time to see if more white patches appeared with successive moltings as occurs in 'progressive graying' (for comparative review of these two conditions, see van Grouw 2018).

'Leucism' tends, in general, to be symmetrical in its appearance whereas 'progressive graying' is more random in disposition (van Grouw 2013, 2018). When one considers the pattern of white feathering on the dorsal surface of the subject (Figures 1 and 2), although there are regions of abnormal white feathers bilaterally, the distributions are not symmetrical. For example, there are more white feathers in the left than right secondaries and tertials (Figure 2). The coloration aberration appears similar to that of a House Sparrow, *Passer domesticus*, suffering from 'progressive graying' as shown in Figure 10 of van Grouw (2012). I am not aware of a previous report of a CHSP with 'progressive graying' although similarly appearing birds have been reported as having 'leucism' (e.g., Lotterhos 2016, Mattie 2020), so the possibility for mischaracterization exists.

Unlike 'leucism', for which numerous genes in pigeons (van Grouw and de Jong 2009) and mammals (Fleck et al. 2016) have been identified, the exact cause(s) of 'progressive graying' in birds is currently unknown and most may not be heritable (e.g., epigenetic, van Grouw 2018). A similar and heritable graying phenotype is seen in horses and is linked to a genomic duplication or triplication of a particular set of genes (Pielberg et al. 2008, Nowacka-Woszuk et al. 2021) that leads to melanocyte and melanin pigment loss (Sundström et al. 2011). How this mutation leads precisely to 'progressive graying' and whether a homologous

mutation is at play in any forms of 'progressive graying' of birds remains to be determined.

Figure 1. Chipping Sparrow, *Spizella passerina*, with 'progressive graying'. Top: right lateral view; B**ottom:** left lateral view. Notice the differences between the patterns between the right and left sides. A normally colored CHSP is present in the left foreground (bottom panel).

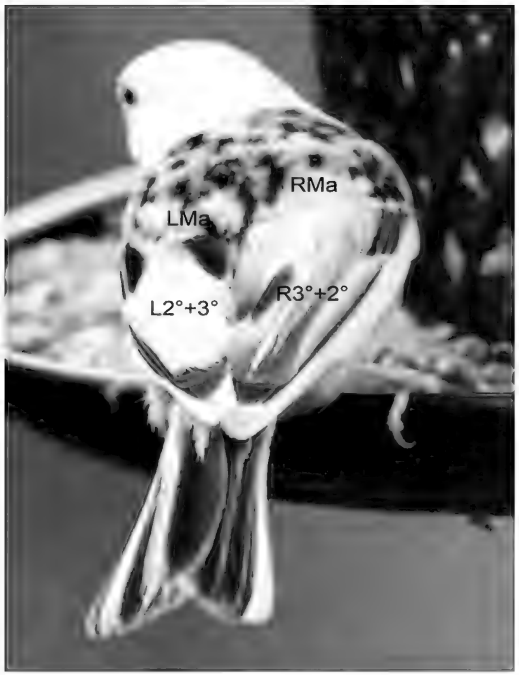


Figure 2. Dorsal view of the Chipping Sparrow allowing comparison of left and right sides. The left and right tertials and secondaries (L2°+3°, R3°+2°) and mantles (LMa, RMa) show asymmetrical patterning consistent with 'progressive graying'.

ACKNOWLEDGMENTS

I warmly thank Hein van Grouw (Senior Curator, Bird Group, Department of Life Sciences, The Natural History Museum, Tring, Hertfordshire, England, UK) for his timely and expert opinion on the color aberrations of the Chipping Sparrow discussed above. Also, I greatly appreciate the constructive comments on preliminary drafts provided by Hein van Grouw, Clive G. Harris (Maryland/District of Columbia Records Committee, Maryland Ornithological Society), and David D. Roberts (Montgomery Bird Club, Maryland Ornithological Society).

LITERATURE CITED

Fleck K., G. Erhardt, and G. Lühken. 2016. From single nucleotide substitutions up to chromosomal deletions: genetic pause of leucism-associated disorders in

animals. *Berliner und Münchener tierärztliche Wochenschrift* 129(7–8):269–281.

Lotterhos, J. 2016. Leucistic Chipping Sparrow. Carolina Bird Club. Available at: https://www.carolinabirdclub.org/gallery/Lotterhos/chsp.html. Accessed on 24 February 2021.

Mattie, R. 2020. Leucistic Chipping Sparrow. The Cornell Lab, Project Feeder Watch. Available at: https://feederwatch.org/unusual-bird/leucistic-chipping-sparrow. Accessed on 24 February 2021.

Nowacka-Woszuk, J., M. Mackowski, M. Stefaniuk-Szumukier, and J. Cieslak. 2021. The equine graying with age mutation of the *STX17* gene: A copy number study using droplet digital PCR reveals a new pattern. *Animal Genetics* 52(2):223–227.

Pielberg, G.R., A. Golovko, E. Sundström, I. Curik, J. Lennartsson, M.H. Seltenhammer, T. Druml, M. Binns, C. Fitzsimmons, G. Lindgren, K. Sandberg, R. Baumung, M. Vetterlein, S. Strömberg, M. Grabherr, C. Wade, K. Lindblad-Toh, F. Pontén, C.-H. Heldin, J. Sölkner, and L. Andersson. 2008. A *cis*-acting regulatory mutation causes premature hair graying and susceptibility to melanoma in the horse. *Nature Genetics* 40(8):1004–1009.

Sundström E., A.Z. Komisarczuk, L. Jiang, A. Golovko, P. Navratilova, S. Rinkwitz, T.S. Becker, and L. Andersson. 2011. Identification of a melanocyte-specific, microphthalmia-associated transcription factor-dependent regulatory element in the intronic duplication causing hair greying and melanoma in horses. *Pigment Cell & Melanoma Research* 25(1):28–36.

van Grouw, H. 2012. What colour is that sparrow? A case study: Colour aberrations in the House Sparrow *Passer domesticus*. *International Studies on Sparrows* 36:30–55.

van Grouw, H. 2013. What colour is that bird? The causes and recognition of common colour aberrations in birds. *British Birds* 106:17–29.

van Grouw, H. 2018. White feathers in black birds. *British Birds* 111:250–263.

van Grouw, H., and J. de Jong. 2009. *Genetica bij duiven, modern mendelisme en meer voor de duivenliefhebber* (*Genetics in the pigeon, modern mendelism and more for the pigeon fancier*). Nederlandse Bond van Sierduivenliefhebbers verenigingen (NBS) (Dutch Association of Fanciers of Fancy Pigeons), Surhuisterveen, The Netherlands. 272 pp.

Maryland Birdlife 70(1):62–67

2020 Fall Flyway Report – Harford County, Maryland

Mark S. Johnson[1] and Amanda K. Subolefsky[2]

[1]*3204 Bryson Court, Baldwin, Maryland 21013*
marksjohnson2@gmail.com
[2]*1615 Deerfield Road Darlington, Maryland 21034*
amandasubolefsky@gmail.com

INTRODUCTION

Determining the relative abundance of bird species is particularly challenging given their highly vagile nature and the relative ability of scientists and naturalists in identifying and distinguishing individuals. Capture-mark-recapture techniques are used to assist scientists in making observations on relative abundance by marking individuals with specifically numbered butt-end bands or sometimes other markers (e.g., color leg bands, patagial markers, etc.). Individuals that are then recaptured can be identified. Additionally, more precise evaluations on avian health (e.g., presence of ectoparasites, body condition, fat stores, etc.) can also be made by having the birds in the hand.

The Mid-Atlantic Fall Flyway report was the means of comparing and archiving banding information from banding stations active in the fall in the Mid-Atlantic region. Those results were published annually in *North American Bird Bander* (*NABB*) along with records from other regions of the United States. After the passing of the editor (Dr. Chandler S. Robbins), those results have not since been published for the Mid-Atlantic region. Here we provide results in the same format for two banding stations in Harford County, Maryland: Eden Mill and Harford Glen from data collected in the fall of 2020.

Banding Station Descriptions

The Eden Mill Banding Station (Figure 1) began in 2000 and is situated at the confluence of Deer Creek and Big Branch in northern Harford County (39°40.37′N, 76°27.19′W). A dam at the mill forms a lake area that reaches and passes this confluence. The land is owned and managed by the Harford County Parks and Recreation Department and contains a historic mill and a nature center that is involved in environmental education. The banding area was historically a parking area for a long-gone skiing slope that has been naturally reclaimed, now consisting of predominantly eastern redcedar (*Juniperus virginiana*), black walnut (*Juglans nigra*), red maple (*Acer rubrum*), pignut hickory (*Carya glabra*), shrubs including northern spicebush (*Lindera benzoin*), and multiple

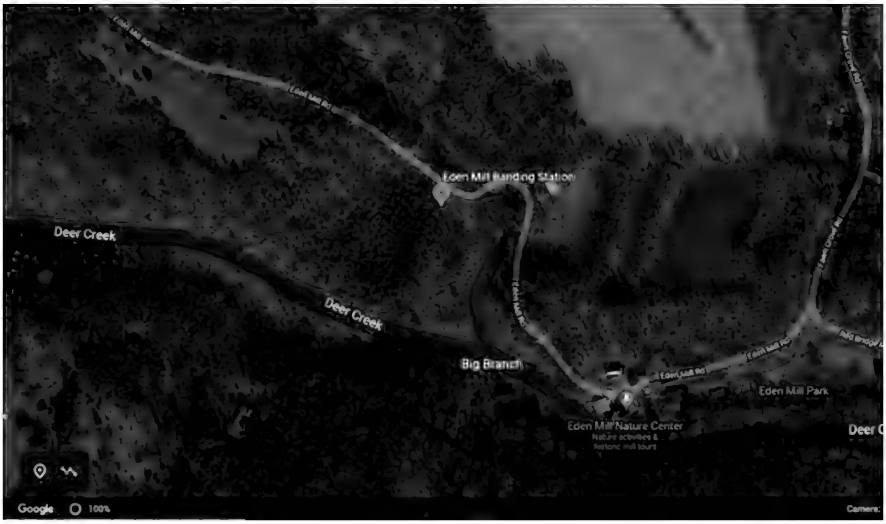


Figure 1. The general net locations of the Eden Mill Banding Station. (Google Earth 2021).

Figure 2. The general net locations of the Harford Glen Banding Station. (Google Earth 2021).

exotics that seem to attract songbirds. The northern and western perimeters transition to forest dominated by white oak (*Quercus alba*) and American beech (*Fagus grandifolia*), and the eastern and southern edges are bordered by wetlands and flowing waters from the two freshwater streams previously mentioned. Most often, thirteen 12-m (40-ft) nets and two 6-m (20-ft) nets of 30-mm^2 (1.2-in^2) mesh were dispersed throughout the flood plain and were opened weekly in 2020 from 30 August through 7 November.

The Harford Glen Banding Station (39°29.17′N, 76°20.37′W) (Figure 2) has a long history of banding activity beginning with work from the late Barbara Bilsborough and volunteers in the early 1980s, transitioning to Sue and Ken Heselton in the 1990s, and to the authors in 2017. It is an often-closed area operated by the Harford County Public Schools system. The nets are dispersed in the transitional forest where Plum Tree Run reaches Atkisson Reservoir. Here, sediment deposits accumulate as it approaches the reservoir forming a delta interspersed with grasses and willows (*Salix* spp.). Typically, thirteen 12-m (40-ft) nets of the same mesh size were opened, often two times per week from 15 September through 19 November. The forest is primarily white oak and American beech; however, it is in a state of transition as roughly 14 ha (35 ac) of eastern white pine (*Pinus strobus*) were removed in 2007 as an action against an infestation of a bark beetle known as the Six-spined Ips or the Coarse-writing Engraver (*Ips calligraphus*). Multiflora rose (*Rosa multiflora*) is a common understory shrub along with northern spicebush (*Lindera benzoin*) and southern arrowwood (*Viburnum dentatum*).

OBSERVATIONS

In general, the fall 2020 banding seasons at both Eden Mill and at Harford Glen did not occur seamlessly. Much paperwork was required of volunteers at Harford Glen to allow them on-site. Public health practices due to the COVID-19 pandemic included practicing social distancing, mask wearing, daily temperature checks, and travel restrictions at both locations. Rainy weather halted banding activities on several days; regardless, breaks in the rain allowed opening some nets for a limited period of time.

Eden Mill – Capture rates (Table 1) were relatively consistent with the previous year. Best date for captures (31 October) included more than 95 individuals captured, the highest total in one day since 2000. A flock of American Goldfinches captured that day skewed the results for the top ten. Warblers were relatively infrequent, but included Tennessee, Mourning, Magnolia, Canada, Black-and-white, Common Yellowthroat, and American Redstart. A large proportion of all captured were hatching year (HY) birds (>70% were HYs). Highlights included Blue-headed Vireos (Figure 3), Purple Finches, Lincoln's Sparrows (Figure 3), and a single Connecticut Warbler. Indigo Buntings were

infrequent this fall. *Catharus* thrushes were relatively numerous (N=11) and included three Gray-cheeked and five Swainson's Thrushes. Two nights focusing on Northern Saw-whet Owls yielded a single HY bird of unknown sex on 5 November. Together, 252 individuals of 33 species were banded and 25 were recaptures.

We also provided instruction to three students: one in high school (Nick Spigler), one entering graduate school (Katie Soltysiak), and two in graduate school seeking training (Shannon Dorsey, Makayla Call).

Harford Glen – Productivity was slightly lower at Harford Glen, likely attributed to more nets increasing the relative amount of effort in terms of net/hours (Table 1). Highlights included 15 *Catharus* thrushes, including four Gray-cheeked and eight Hermit Thrushes. Chipping Sparrows (N=16) were common at Harford Glen yet not observed at Eden Mill, and single Connecticut Warblers were captured at both sites. The most common warbler species captured was Magnolia (N=9) and five Brown Thrashers were marked (not encountered at Eden Mill). The most common species found at both sites included White-throated Sparrows, Gray Catbirds, and Northern Cardinals (Table 2). Altogether, Harford Glen handled 422 birds, 337 of them receiving new bands (51 recaptures).

Table 1. Productivity summary data, fall 2020.

	Eden Mill	**Harford Glen**
First day	30 August	15 September
Last day	7 November	19 November
Days open	11	16
Nets used	14	13
Net hours	428	787
Best day	96	50
Best day date	31 October	5 November
Most species	20	18
Most species date	10 October	13 October
Banded 2019	193	342
Banded 2020	252	337
Species 2019	30	40
Species 2020	33	45
Birds/100 net hours 2019	60.5	55
Birds/100 net hours 2020	72.5	53.6
% Hatching year 2019	76%	76%
% Hatching year 2020	82%	89%

Figure 3. Blue-headed Vireo, *Vireo solitarius*, (left); Lincoln's Sparrow, *Melospiza lincolnii*, (right). Eden Mill Banding Station, photographed by Mark S. Johnson during the fall 2020 banding season.

Table 2. Ten most commonly banded species, fall 2020. The first number (**No.**) indicates the number of individuals of each species banded and the final number (**%HY**) is the percentage determined to be hatching year birds.

Eden Mill			Harford Glen		
No.	**Species**	**%HY**	**No.**	**Species**	**%HY**
68	White-throated Sparrow	82	91	White-throated Sparrow	63
31	American Goldfinch	94	50	Northern Cardinal	100
24	Song Sparrow	81	29	Gray Catbird	97
20	Gray Catbird	89	16	Chipping Sparrow	63
20	Northern Cardinal	93	16	Song Sparrow	100
13	Common Yellowthroat	68	12	Carolina Wren	100
12	Carolina Wren	75	10	Field Sparrow	80
6	Carolina Chickadee	75	9	American Goldfinch	100
5	Swamp Sparrow	80	9	Swamp Sparrow	89
5	Swainson's Thrush	80	8	Hermit Thrush	100

DISCUSSION

Many natural areas in the mid-Atlantic region are becoming frequently important as virtual islands of habitat as wintering and migratory stop-over sites for songbirds. Therefore, monitoring their use is becoming more relevant for the continued success of those species. Harford Glen was originally established as a

buffer to support a reservoir as a possible water supply for nearby Aberdeen Proving Ground in the 1940s. Since then, much of the land surrounding this area has been converted to suburban housing and development. Habitat changes around Eden Mill are less suburban and remain rural. Causal observations show that these areas containing transition habitats (ecotones) contain food (e.g., fruits containing carbohydrates and fats) that are important for migrants balancing molt with migratory energetic requirements. However, annual changes in these data must be evaluated with care since short-term changes may reflect the attractiveness of these habitat islands than reveal any meaningful changes in relative abundance. Both Eden Mill and Harford Glen represent the only bird banding locations in Harford County and are therefore the only current source of this information.

Days reporting relatively high species diversity are typically not the same as the days of highest productivity. High species counts are often a consequence of a mix of wintering birds arriving when the last of the Neotropical migrants are leaving the area. Days of high productivity tend to be mostly sparrows that are foraging on fruits/carbohydrates at or near net level.

Often differences in species encounters can be attributed to differences in habitat. However, during migration and wintering, some species are more plastic in their niche preferences. There are some interesting differences between these two locations in species encountered. Eden Mill typically encounters Northern Waterthrushes reliably in spring, but very rarely in the fall. Harford Glen netted four Northern Waterthrushes this fall. Both sites seem to contain habitat consistent with Northern Waterthrush use. Whether there are some minor geophysical or spatial differences that help explain the subtle differences in their presence between sites is currently unknown.

ACKNOWLEDGMENTS

Many thanks to volunteers from Eden Mill and Harford Glen: Al Conrad, Dr. Dennis Kirkwood, Dr. Dave Larkin, Mary Murray, Phil Powers, Suzanne Procell, Dr. Jane Scocca, Mary Trotta, Dr. Robert Werrlein, Jean Wheeler, and Mike White. Together they put in more than 790 volunteer hours over the course of this season.

LITERATURE CITED

Goggle Earth. 2021. Google Earth. Available at: https://www.google.com/earth/. Accessed on 4 February 2021.

Maryland Birdlife 70(1):68–80

2020 Maryland May Count

Marilyn E. Veek

8714 Reichs Ford Road, Frederick, Maryland 21704
mveek@yahoo.com

In a normal year, the Maryland May Count is conducted on the second Saturday in May, through county coordinators recruiting and organizing observers to cover their territory; collecting, reviewing for quality/accuracy, and collating the data; and sending it to the state coordinator for preparation of this report. 2020 was not a normal year. It marked the onset of the COVID-19 pandemic as well as the first year of the Maryland-District of Columbia Breeding Bird Atlas 3 (BBA3). The Maryland Ornithological Society (MOS) decided to hold an alternative event, the Carbon-Free COVID-Free (C-Free) May Count, which was promoted as a home-based, carbon-free state-wide count, a weekend of birding in your own neighborhood and participating in Cornell's Global Big Day. Counters were urged to limit their travel to walking or cycling and to observe the social distancing guidelines. To maximize the chance of good weather, the count included both Saturday, 9 May and Sunday, 10 May 2020. Participants were asked to share their checklists with a group eBird account. It should be noted that some county coordinators did recruit observers and attempt to assure broad coverage, including in Garrett, Frederick, Carroll, Dorchester and Worcester Counties. Many birders around the state were also participating in BBA3, submitting their data through a special data portal to eBird. All of the data submitted to eBird in Maryland on 9 and 10 May were obtained for this report and combined with data from the C-Free Count. For these reasons, data presented in this report are not directly comparable to data from past May Counts.

Table 1 presents the number of observers, as a total and split by C-Free Only Observers and Other Observers. The C-Free Only numbers include those observers who submitted their lists only to the C-Free count and not through the BBA3 portal. A number of observers submitted counts in more than one county as shown by the difference between Sum of Observers and Unique Observers. This Table also includes total species and total individual birds by county, as well as state total unique species and individual birds. Although there were 2.6 times more observers in 2020 than in 2019, the total number of birds reported was only 1.6 times the 2019 total.

Table 1. Summary of observers, species, and total birds by county.

County	Code	Total Observers	C-free only Observers	Other Observers	Total Species	Total Birds
Garrett	GA	36	13	23	160	9,196
Allegany	AL	18	2	16	113	2,250
Washington	WA	40	2	38	127	4,671
Frederick	FR	86	11	75	125	7,767
Montgomery	MO	230	24	206	168	24,247
Carroll	CA	54	14	40	119	7,423
Howard	HO	121	34	87	136	12,592
Baltimore	BA	194	31	163	165	20,826
Harford	HA	51	3	48	147	8,738
Cecil	CE	20	1	19	102	1,876
Prince George's	PG	86	8	78	141	11,342
Anne Arundel	AA	107	8	99	165	11,627
Charles	CH	22		22	108	1,786
Calvert	CT	40	1	39	148	5,606
St. Mary's	SM	35	2	33	153	4,408
Kent	KE	6	3	3	90	1,183
Queen Anne's	QA	31	2	29	138	4,964
Talbot	TA	32	5	27	135	5,745
Dorchester	DO	17	1	16	160	13,877
Caroline	CN	18	1	17	102	2,854
Wicomico	WI	9	3	6	82	1,514
Worcester	WO	12		12	151	5,117
Somerset	SO	3	2	1	63	404
Sum of Observers		1,268	171	1,097		
Unique Observers		1,138	163	975		
Total Unique Species					239	
Total Individuals						170,013

The weather was chilly and fair on 9 May, with morning lows in the 20s °F in Western Maryland and afternoon highs only reaching the freezing mark there. Afternoon temperatures were only in the 40s °F and low 50s °F throughout the state. Winds were gusty, which probably impacted bird flight and sound. On 10 May, it was clear, slightly warmer and less windy, with afternoon highs mostly in the mid-60s °F.

Tables 2 and 3 present the counts by species and county, as well as state-wide totals. Although the data cannot readily be compared with 2019, as discussed above, a few observations can be made. Cattle Egrets were present in significantly larger numbers than usual, with 24 in Anne Arundel County, 30 in Queen Anne's, 19 in Talbot, and 12 in Worcester. Worcester County also reported 167 Glossy Ibis. A total of 12 Merlin was reported, five from Garrett

County, two from Howard, one from Prince George's, and four from Anne Arundel, compared to none in 2019.

The cool spring of 2020 seems to have impacted the species/numbers seen. For example, very high numbers of White-throated Sparrows and Yellow-rumped Warblers were reported, along with higher than expected (in proportion to the overall numbers of birds observed this year) numbers of other over-wintering birds such as Bufflehead, Hooded and Common Mergansers, Bonaparte's Gulls, Ruby-crowned Kinglets, and House Finches. Not surprisingly, counts of flycatchers (Great Crested, Eastern Wood-Pewee, Acadian), vireos (Red-eyed, White-eyed), Wood Thrush, Grasshopper and Field Sparrows, Yellow-breasted Chat, Bobolink, Eastern Meadowlark, both tanagers, Blue Grosbeak, and Indigo Bunting were all lower than expected. Least, Spotted, and Solitary Sandpipers, Bank, Tree, and Barn Swallows had begun arriving in sizable numbers.

Table 2. Western Maryland observed species

Species	GA	AL	WA	FR	MO	CA	HO	BA	HA	CE	PG	AA
Canada Goose	228	107	130	158	939	317	852	807	363	35	425	338
goose sp.					7							
Mute Swan								8				
Wood Duck	54	3	37	2	156	5	47	62	44		128	29
Blue-winged Teal	14						2	1	1			1
Mallard	60	6	57	91	171	16	132	333	59	4	99	137
American Black Duck									1			2
Mallard x Am. Black Duck (hybrid)											2	
Canvasback						1						
Ring-necked Duck	8					2			2		1	
Greater Scaup												1
Lesser Scaup	4				2							
White-winged Scoter												1
Bufflehead	41				1							2
Hooded Merganser	5	5	9	1	29	6			9		8	
Common Merganser	6	4	4		24				2		2	2
Red-breasted Merganser	2	5	1		5					2		
duck sp.			1	2	6		1		2		6	1
Wild Turkey	50	1	3	2	19		1	1	4		5	5
Ruffed Grouse	2											
Ring-necked Pheasant						2						
Pied-billed Grebe					6			4			1	
Rock Pigeon	47	31	23	26	44	15	36	177	5	1	38	68
Mourning Dove	83	24	93	207	534	219	324	547	113	36	255	258
Yellow-billed Cuckoo		2	2	1	14		2	4	1		7	3
Black-billed Cuckoo			2		6		1	5	2		2	
Yellow-billed/Black-billed Cuckoo											2	
Common Nighthawk					4				1		6	3
Eastern Whip-poor-will							2					
Chimney Swift	15	120	44	56	302	25	173	825	103	9	257	149
Ruby-throated Hummingbird	38	3	13	25	42	27	50	63	23	9	14	37
King Rail												1

Species	GA	AL	WA	FR	MO	CA	HO	BA	HA	CE	PG	AA
Virginia Rail	9				1		3	1	2			1
Sora	5				3	4			1			1
Common Gallinule					2			1				
American Coot	1				2			3				
Black-bellied Plover	1											
Killdeer	13	9	9	14	28	6	6	18	5		19	3
Semipalmated Plover	6				20							1
Dunlin					2							
Least Sandpiper	5			19	134		9	11	40		1	32
Semipalmated Sandpiper					6			3	16			1
peep sp.	1				6							1
American Woodcock	2											
Wilson's Snipe	3			1								
Spotted Sandpiper	48	17	6	15	84	18	32	44	19		40	15
Solitary Sandpiper	44	2	1	21	112	6	65	52	37	3	45	14
Lesser Yellowlegs	9			10	13	2	15	15	41	8	27	25
Greater Yellowlegs			1		7	1	2	3	27	1	11	2
shorebird sp.					16						4	5
Bonaparte's Gull					284				80	70		1
Laughing Gull									23	16	188	131
Ring-billed Gull	3				53			308	44	58	8	45
Herring Gull					1			53	14	1	46	85
Great Black-backed Gull								4				73
gull sp.					5			20	1	2		12
Least Tern								37	9			18
Caspian Tern								20	12	1	5	88
Black Tern	4				3							
Common Tern	1				4							
Forster's Tern								3	1			13
tern sp.									5			5
Common Loon	1	7			9		1	16				7
Double-crested Cormorant	51	8	53	15	348	5	36	131	781	325	34	1174
American White Pelican									1	1		
Brown Pelican												1
American Bittern	1	1	1		2			1				
Least Bittern					2			2	1			1
Great Blue Heron	5		12	19	95	5	38	59	208	44	31	67
Great Egret					22		2	10		3	2	10
Snowy Egret								2				20
Little Blue Heron								25		1		1
Cattle Egret												24
white egret sp.					1							7
Green Heron	12	7	3	5	49	3	8	24	10	2	14	13
Black-crowned Night-Heron				33	10			8			1	1
Yellow-crowned Night-Heron				3	1			12			2	
Glossy Ibis					14			1				
Black Vulture	1	4	14	59	170	103	150	167	179	45	171	211
Turkey Vulture	102	56	80	170	344	186	192	329	184	47	249	235
Osprey	21		2	6	49	7	41	128	98	17	118	268
Northern Harrier	1			2			3	1		1	3	4
Sharp-shinned Hawk	4		1	2	4	1	3	6	4	1	3	46
Cooper's Hawk	5	1	2	12	18	5	13	20	3		11	9
Accipiter sp.	1				2			1	1			

Species	GA	AL	WA	FR	MO	CA	HO	BA	HA	CE	PG	AA
Bald Eagle	16	5	9	7	35	11	15	44	203	23	52	44
Red-shouldered Hawk	5	2	13	29	97	23	97	76	21	6	34	26
Broad-winged Hawk	21	2	3	1	5		3	5	3			7
Red-tailed Hawk	26	4	17	34	55	38	35	67	28	2	25	20
Red-should. x Red-tail. Hawk (hybrid)									1			
Buteo sp.				1		1	3	1			1	1
hawk sp.				4	8		2	4	1		5	
Eastern Screech-Owl	1				1	1		2	1			3
Great Horned Owl	2		2	2	2			1				7
Barred Owl	4	1	2	14	33	3	20	11	5	1	12	11
Belted Kingfisher	6	2	6	3	47	10	11	27	8	1	17	21
Red-headed Woodpecker	25		2	9	16	11	5	9				3
Red-bellied Woodpecker	72	29	81	125	395	118	305	284	103	13	130	127
Yellow-bellied Sapsucker	6					2		2				
Downy Woodpecker	69	16	51	105	269	93	208	208	57	11	92	85
Hairy Woodpecker	42	1	16	32	74	33	68	54	12		31	35
Downy/Hairy Woodpecker			12	5	14	5	11	8			2	8
Northern Flicker	55	8	10	25	97	13	52	77	11	4	23	11
Pileated Woodpecker	24	7	29	39	99	30	61	58	27	3	27	14
woodpecker sp.			1		5		1	1	1			1
American Kestrel	7		1		6	4	2	4		2	7	3
Merlin	5						2				1	4
Peregrine Falcon			2		2			6				2
diurnal raptor sp.								1				
Great Crested Flycatcher	1	2	44	56	180	24	61	88	35	4	49	52
Eastern Kingbird	11	3	30	25	166	74	50	128	34	6	113	91
Eastern Wood-Pewee		1	12	8	34	2	21	17	21	2	19	13
Acadian Flycatcher	2		19	2	34	2	8	13	16	1	6	11
Willow Flycatcher					2	1		1			1	
Alder/Willow Fly. (Traill's Flycatcher)									2		1	
Least Flycatcher	13	1		6	3	2		3			2	
Empidonax sp.	4			1	1		2	1			4	1
Eastern Phoebe	109	20	37	48	108	49	57	64	31	8	43	20
Tyrannidae sp.		1	3		1			7			2	1
White-eyed Vireo	2	1		5	38	7	27	35	17	3	27	25
Yellow-throated Vireo	6	2	5	6	21	5	6	19	12		7	17
Blue-headed Vireo	68	1	1	5	13	2	10	25	5	1	4	2
Warbling Vireo	1	8	47	4	35	6	13	35	46	2	9	4
Red-eyed Vireo	13	19	91	58	250	25	148	136	77	16	113	142
vireo sp.					2		1		1		1	
Blue Jay	175	53	99	252	499	227	416	372	138	22	163	229
American Crow	192	19	80	132	408	214	335	359	78	13	152	176
Fish Crow		1	39	61	155	26	67	79	32	12	59	89
crow sp.			13	17	70	8	36	22	16		22	10
Common Raven	36	10	13	4	25	2	9	7	1		5	
Horned Lark	1		5		4		7	2			1	1
Bank Swallow	5	5	9	4	107	22	1	71	30		23	49
Tree Swallow	216	35	89	146	672	79	198	346	298	259	680	146
Northern Rough-winged Swallow	17	17	34	65	243	70	66	199	94	21	48	45
Purple Martin	12		2	16	94	26	14	14	22	3	18	34
Barn Swallow	468	99	83	159	1780	289	314	603	546	30	694	555
Cliff Swallow	24	9	63		36	10	33	13	3		18	10
swallow sp.		4		50	471		7	112	16	2	11	70

Species	GA	AL	WA	FR	MO	CA	HO	BA	HA	CE	PG	AA
Carolina Chickadee			82	98	343	66	191	312	97	18	162	180
Black-capped Chickadee	246	17										
Carolina/Black-capped Chickadee		3	3	14		1						
Tufted Titmouse	102	24	68	85	252	58	188	253	69	17	118	158
Red-breasted Nuthatch	5											
White-breasted Nuthatch	94	14	35	82	224	65	130	176	41	3	54	64
Brown Creeper	30				1							
House Wren	55	19	39	100	150	103	147	157	40	6	45	24
Winter Wren	3				1			1	2			
Marsh Wren	2							2			1	12
Carolina Wren	38	72	143	225	544	155	358	440	140	23	257	231
wren sp.				1	4			5				1
Blue-gray Gnatcatcher	61	23	105	93	525	75	222	413	171	12	178	163
Golden-crowned Kinglet	15											
Ruby-crowned Kinglet	93	12	2	12	20	7	13	59	7	1	7	4
Eastern Bluebird	58	22	79	135	356	140	230	187	81	15	180	153
Veery	31	1	5	1	22	3	6	24	5	1	11	11
Gray-cheeked Thrush				1				4				1
Swainson's Thrush	15		2		11		6	19		1	13	11
Hermit Thrush	46		1	1				4				
Catharus sp.								2				
Wood Thrush	49	12	34	69	135	32	49	111	35	11	57	42
American Robin	701	161	187	588	1252	380	474	1255	192	43	469	303
Gray Catbird	249	89	158	273	653	305	447	701	197	25	181	166
Brown Thrasher	46	9	25	48	33	34	26	20	12	5	25	26
Northern Mockingbird	2	11	34	57	159	88	123	161	69	15	151	120
European Starling	397	74	246	437	824	540	379	1206	207	50	651	367
Cedar Waxwing	2		17	9	140	109	81	179	2		121	58
House Sparrow	72	57	88	287	807	248	209	814	58	11	295	201
American Pipit									3			
House Finch	40	28	104	217	312	225	286	412	91	37	126	244
Purple Finch	30	2										3
Pine Siskin	1											
American Goldfinch	463	85	177	313	569	254	354	448	165	44	208	253
Acanthis/*Spinus* sp.								2				
Grasshopper Sparrow	2		5		11		1	1				7
Chipping Sparrow	275	27	108	158	279	255	265	279	130	19	158	107
Field Sparrow	62	11	38	36	56	12	49	38	17	2	6	7
Dark-eyed Junco	26		2		1							
White-crowned Sparrow	30	18	4	10	4	5		11	4		1	3
White-throated Sparrow	37	24	20	55	127	77	126	340	117	7	60	79
Vesper Sparrow	1	1	2		1							
Seaside Sparrow												5
Henslow's Sparrow	1											
Savannah Sparrow	4				5	4	1	13			7	7
Song Sparrow	364	74	43	99	221	167	149	159	48	5	65	34
Lincoln's Sparrow	5	1			1			3				
Swamp Sparrow	40				5	6	4	20	7		2	3
Eastern Towhee	221	29	36	38	207	40	124	78	45	12	57	45
sparrow sp.		10		1	9	6	9	27			18	4
Yellow-breasted Chat	2		4	2	11		4	5	7		7	8
Bobolink	56	2		34	27	42	53	16	23	10	16	2
Eastern Meadowlark	24	2	14	10	13		15	3	2	3	8	4

Species	GA	AL	WA	FR	MO	CA	HO	BA	HA	CE	PG	AA
Orchard Oriole	10	7	8	8	85	18	23	47	79	4	43	28
Baltimore Oriole	123	35	80	38	174	34	75	162	58	13	27	16
Red-winged Blackbird	609	83	63	213	725	260	457	533	419	68	745	536
Brown-headed Cowbird	89	9	74	143	338	158	144	279	157	30	162	138
Rusty Blackbird		2										1
Common Grackle	189	84	168	293	565	185	234	459	64	8	434	418
Boat-tailed Grackle												5
blackbird sp.				5	2			10	4		1	10
Ovenbird	66	8	8	16	89	13	50	134	45	26	40	39
Worm-eating Warbler	2	1	10	3	12		10	15	7	3		4
Louisiana Waterthrush	15	2	14	13	33	2	14	25	13			3
Northern Waterthrush	10	1			8	6	4	20	5		4	3
Louisiana/Northern Waterthrush					1		2	2	2			
Golden-winged Warbler	4							1	1			
Blue-winged Warbler	4	2	1		3	2	3	9	5	2	3	1
Lawrence's Warbler (hybrid)					1							
Black-and-white Warbler	35	3	18	5	37	6	40	116	55	2	19	40
Prothonotary Warbler	4		8	4	24		2		10		3	16
Tennessee Warbler				2	4	2	1	4	2			
Nashville Warbler	14	2	1	2	5	1	5	12	2		1	2
Mourning Warbler								1				
Kentucky Warbler	4		1		1		2	2	9		1	1
Common Yellowthroat	141	18	12	65	228	35	94	198	78	4	72	108
Hooded Warbler	28				1		4	8	2		2	6
American Redstart	74	5	13	13	77	10	77	129	87	6	24	59
Cape May Warbler	14	1	2	2	26	5	17	17	9	1	10	
Cerulean Warbler	5		7		1			3	26			
Northern Parula	35	9	28	30	146	17	61	147	76	3	57	74
Magnolia Warbler	8	2	2	1	17	2	5	12	12	4	9	6
Bay-breasted Warbler	3	1		1	2		1	1	1		1	2
Blackburnian Warbler	22		1	1	2		2	6	7		3	
Yellow Warbler	95	10	15	8	42	36	29	79	26	3	28	24
Chestnut-sided Warbler	41	1	6	8	42	5	22	66	12		7	3
Blackpoll Warbler					1		12	6	3		1	2
Black-throated Blue Warbler	35	3	3	20	65	6	57	115	43	1	10	24
Palm Warbler	17	2	3	2	16	7	7	19	1		3	10
Pine Warbler	3		5	6	12		3	5	1	1	12	14
Yellow-rumped Warbler	149	22	125	92	347	86	200	326	171	5	144	157
Yellow-throated Warbler	3	2	7	1	5		3		5		5	10
Prairie Warbler			17	2	43	1	21	15	12	2	5	9
Black-throated Green Warbler	97	8	13	9	28	1	13	46	34		4	5
Canada Warbler	11			1	8		5	15	3		4	
Wilson's Warbler		1		1	13	1	4	17	7		6	4
warbler sp.			2		3			6	2		1	
Summer Tanager		1			7						2	12
Scarlet Tanager	22	24	44	41	103	13	57	83	26	5	34	38
tanager sp.												2
Northern Cardinal	182	106	250	489	1400	368	926	1052	341	61	525	637
Rose-breasted Grosbeak	134	25	11	51	27	22	19	36	7	2	7	16
Blue Grosbeak			1	1	14	4	10	22	5	1	27	33
Indigo Bunting	24	25	61	43	199	60	108	107	85	11	96	65
passerine sp.				3	1			2				

Table 3. Southern Maryland, Eastern Shore, and total observed species

Species	CH	CT	SM	KE	QA	TA	DO	CN	WI	WO	SO	Total
Snow Goose							28			1		29
Canada Goose	57	51	96	10	213	94	234	60	64	225	20	5823
goose sp.												7
Mute Swan						3						11
Tundra Swan					3					1		4
Wood Duck	26	8	20	9	7	25	42	18	10	10		742
Blue-winged Teal							2					21
Northern Shoveler										6		6
Mallard	10	60	22	2	95	180	165	8	16	111	3	1837
American Black Duck							25			4		32
Mallard x Am. Black Duck (hybrid)												2
Green-winged Teal							4					4
Canvasback												1
Redhead					1							1
Ring-necked Duck												13
Greater Scaup					4							5
Lesser Scaup												6
White-winged Scoter												1
Black Scoter		2			3		8					13
Bufflehead		4			5		3					56
Common Goldeneye					1							1
Hooded Merganser												72
Common Merganser												44
Red-breasted Merganser										1		16
Ruddy Duck					16		43			1		60
duck sp.		1								8		28
Northern Bobwhite					10		2		2			14
Wild Turkey	5	2	21	2	13	19	7	7		5		172
Ruffed Grouse												2
Ring-necked Pheasant												2
Pied-billed Grebe			1			2				6		20
Rock Pigeon	4	11			30	23	17	12	2	10		620
Mourning Dove	48	116	76	32	59	76	185	59	30	40	9	3423
Yellow-billed Cuckoo	2		5	4	3	1	6		2	5		64
Black-billed Cuckoo												18
Yellow-billed/Black-billed Cuckoo												2
Common Nighthawk												14
Chuck-will's-widow	2		3				5			9		19
Eastern Whip-poor-will		1	1				2			6		12
Chimney Swift	25	55	15	1	3	10	8	16	12	10	1	2234
Ruby-throated Hummingbird	10	18	21	6	4	23	34	32	6	21	7	526
Clapper Rail		3					38			11		52
King Rail							3					4
Virginia Rail		1	1				20			2		41
rail sp.					1							1
Sora		2				1						17

Species	CH	CT	SM	KE	QA	TA	DO	CN	WI	WO	SO	Total
Common Gallinule			2				4					9
American Coot												6
Black-necked Stilt						1	3			1		5
American Oystercatcher							1			17		18
Black-bellied Plover				47		53	47			14		162
Killdeer	1	3	16		10	13	20	5	2	4		204
Semipalmated Plover		3	3		52	84	23	23				215
Upland Sandpiper		2										2
Ruddy Turnstone						6				54		60
Sanderling		1	3				4			11		19
Dunlin			1			99	504			120		726
Purple Sandpiper		1										1
Least Sandpiper	1	46	12	20	76	231	254	8	83	62		1044
White-rumped Sandpiper						3	3					6
Pectoral Sandpiper						5						5
Semipalmated Sandpiper		98	3		6	188	248	14	9	35		627
peep sp.			1		3		20			84		116
Short-billed Dowitcher							3			6		9
Long-billed Dowitcher		1										1
American Woodcock			2									4
Wilson's Snipe		1	1									6
Spotted Sandpiper	2	11	16	2	5	7	12	2	3	11	1	410
Solitary Sandpiper	3	2	7	12	1	31	3	1		1		463
Lesser Yellowlegs	10	19		1	80	93	96			29		493
Willet					1	6	7			26		40
Greater Yellowlegs	6	2	3	3	29	66	58	1	3	10		236
shorebird sp.		6			5		10			20		66
Wilson's Phalarope					4							4
Bonaparte's Gull		1	20			32	4	1				493
Laughing Gull		49	12	1	128	444	2708	336	283	521	30	4870
Ring-billed Gull		64	15	20	66	131	8	5	1	24		853
Herring Gull		32	3		9	8	57	5	22	344		680
Great Black-backed Gull		5	6		16		12			36		152
gull sp.			12	15	1					3		71
Least Tern				3	7	18	1			6		99
Caspian Tern		4	1	7	6	1	8	4		1		158
Black Tern												7
Common Tern		1	2		2					44		54
Forster's Tern		5	6		8	11	57	4		124	2	234
Royal Tern		20	1		5		17			69		112
tern sp.		4										14
Black Skimmer										30		30
Common Loon		2	10		3		2			3	1	62
Northern Gannet		1										1
Double-crested Cormorant	19	123	404	24	72	55	217	43	14	137	23	4092
American White Pelican							4					6
Brown Pelican			104			10	41			24		180
American Bittern					2							8
Least Bittern			1		2		1					10

Species	CH	CT	SM	KE	QA	TA	DO	CN	WI	WO	SO	Total
Great Blue Heron	12	19	42	16	25	64	112	21	8	13	3	918
Great Egret	6	2	2			3	53	1		25	2	143
Snowy Egret		46	3		3	4	28			45		151
Little Blue Heron										10		37
Tricolored Heron										2		2
Cattle Egret					30	19				12		85
white egret sp.		1										9
Green Heron		10	6		13	2	13	2	3	4		203
Black-crowned Night-Heron			3				1			4		61
Yellow-crowned Night-Heron												18
Glossy Ibis		1				14	70			167	5	272
Black Vulture	39	102	59	20	48	30	26	17		10	1	1626
Turkey Vulture	47	93	81	33	173	129	240	74	44	79	17	3184
Osprey	30	91	109	17	65	70	156	37	17	15	5	1367
Northern Harrier	2	2	1		1	2	2	1				26
Sharp-shinned Hawk		1	1							1		78
Cooper's Hawk	2	2	2	1			3	2	1	1		113
Accipiter sp.												5
Bald Eagle	16	25	21	24	27	39	178	14	5	9	3	825
Red-shouldered Hawk	4	9	10	2	5	4	2	4	1	1		471
Broad-winged Hawk		1	1	1								53
Red-tailed Hawk	4	7	11	5	4	5	16	6	2	3		414
Red-should. x Red-tail. Hawk (hybrid)												1
Buteo sp.												8
hawk sp.	1											25
Eastern Screech-Owl						2	9			3		23
Great Horned Owl		2	3			2	3			2		28
Barred Owl	1	9	3	1		1	1	6		2		141
Belted Kingfisher		6	5			2	1	1	2	2		178
Red-headed Woodpecker	2		3		4	4	29		1	3		126
Red-bellied Woodpecker	34	87	39	19	36	41	29	37	20	8	4	2136
Yellow-bellied Sapsucker												10
Downy Woodpecker	17	58	25	5	27	14	26	20	7	10	4	1477
Hairy Woodpecker	2	14	2	2	17	5	3	6	1			450
Downy/Hairy Woodpecker												65
Northern Flicker	4	4	4		3	5	16	2		4		428
Pileated Woodpecker	3	20	4	6	7	10	26	8	4	10		516
woodpecker sp.		2										12
American Kestrel			1									37
Merlin												12
Peregrine Falcon												12
diurnal raptor sp.												1
Great Crested Flycatcher	12	31	24	11	50	40	103	29	21	29	5	951
Eastern Kingbird	21	19	37	4	24	34	61	19	2	5		957
Eastern Wood-Pewee	7	10	4	4	16	9	23	9		10		242
Acadian Flycatcher	8	19	6	2	4	1	5	2		11	3	
Willow Flycatcher		1										6
Alder/Willow Fly. (Traill's Flycatcher)												3
Least Flycatcher		1	1				1					

Species	CH	CT	SM	KE	QA	TA	DO	CN	WI	WO	SO	Total
Empidonax sp.												14
Eastern Phoebe	7	11	4	11	5	6	1	27		9		675
Tyrannidae sp.												15
White-eyed Vireo	9	29	10	4	25	3	35	12	1	31		346
Yellow-throated Vireo	4	7	1				1			4		123
Blue-headed Vireo						1	1					139
Warbling Vireo				2	7	1	2					222
Red-eyed Vireo	35	98	33	15	75	33	57	31	2	37	3	1507
vireo sp.		1										6
Blue Jay	35	89	67	10	50	70	60	40	33	10	5	3114
American Crow	36	116	68	4	35	75	222	29	18	53	5	2819
Fish Crow	6	58	36	3	22	34	22	10	16	19	4	850
crow sp.	4	2	7		9	1	9		10	10	3	269
Common Raven												112
Horned Lark			3		10	4	22	1		3		64
Bank Swallow		7	9	2	20	4	18	2		1		389
Tree Swallow	27	312	47	13	198	460	1061	111	74	101	1	5569
Northern Rough-winged Swallow	3	10	10	1		4	7	2		5		961
Purple Martin	2	28	19	11	25	81	169	91	8	260	5	954
Barn Swallow	91	209	445	43	178	262	600	108	63	188	5	7812
Cliff Swallow		3	1									223
swallow sp.	4	25	2	80								854
Carolina Chickadee	48	105	61	12	82	72	103	57	22	47	2	2160
Black-capped Chickadee												263
Carolina/Black-capped Chickadee												21
Tufted Titmouse	49	136	62	14	40	56	96	69	16	56	3	1989
Red-breasted Nuthatch												5
White-breasted Nuthatch	23	42	11	12	10	11	1	14	3	2		1111
Brown-headed Nuthatch		4	24		14	6	73			1	5	127
Brown Creeper												31
House Wren	2	31	5	2	3	13	32		24	4	2	1003
Winter Wren												7
Marsh Wren		5	3		2		9			2		38
Carolina Wren	27	165	116	41	104	110	159	61	27	47	2	3485
wren sp.												11
Blue-gray Gnatcatcher	41	69	33	14	39	13	47	13		55	7	2372
Golden-crowned Kinglet												15
Ruby-crowned Kinglet	1	2	2		1	1	2			1		247
Eastern Bluebird	40	129	113	22	64	81	90	71	8	17	5	2276
Veery	2	12	7		16	5		1		1	3	168
Gray-cheeked Thrush												6
Swainson's Thrush	2	3	3		2		1					89
Hermit Thrush												52
Catharus sp.	1											3
Wood Thrush	26	31	20	5	27	16	17	21	1	15	1	816
American Robin	24	82	54	20	195	109	390	82	99	42	28	7130
Gray Catbird	20	112	99	17	106	36	45	33	33	51	9	4005
Brown Thrasher	13	38	28	7	24	28	22	17	4	9		499
Northern Mockingbird	7	50	52	11	55	52	131	24	14	30	6	1422

Species	CH	CT	SM	KE	QA	TA	DO	CN	WI	WO	SO	Total
European Starling	31	101	180	29	294	123	483	122	54	151	21	6967
Cedar Waxwing		14	10	6	20	5	7					780
House Sparrow	25	89	65	16	53	25	43	51	14	49	10	3587
American Pipit												3
House Finch	31	141	68	16	38	64	14	34	36	24	9	2597
Purple Finch												35
Pine Siskin												1
American Goldfinch	57	199	72	46	52	94	96	87	12	35	16	4099
Acanthis/*Spinus* sp.								1				3
Grasshopper Sparrow		4	3	2	2	6	7	5	2	2		60
Chipping Sparrow	51	153	94	17	67	83	213	77	10	55	8	2888
Field Sparrow	5	11	7		21	15	9	14	1	16		433
Dark-eyed Junco												29
White-crowned Sparrow			2		6							98
White-throated Sparrow	6	32	10	4	14	12	19	8		12		1186
Vesper Sparrow							2	1				8
Seaside Sparrow		3	1				49			9		67
Saltmarsh Sparrow							1				1	2
Henslow's Sparrow												1
Savannah Sparrow		3	30		1	3	6			1		85
Song Sparrow	4	28	9		8	4	7		3	11		1502
Lincoln's Sparrow		2										12
Swamp Sparrow	1	10	2		1	2	2			3		108
Eastern Towhee	10	27	13	1	22	8	31	7	1	9		1061
sparrow sp.			3		2							89
Yellow-breasted Chat	3	4	3	1	8	4	13	2	2	9		99
Bobolink	2		21		1	2						307
Eastern Meadowlark	2	9	13		9	5	22	1		3		162
Orchard Oriole	5	22	14	14	19	12	29	3	5	5	3	491
Baltimore Oriole	2	4	4	4	14	6	1	6	1	1		878
Red-winged Blackbird	55	195	115	73	277	293	1100	62	32	166	17	7096
Brown-headed Cowbird	24	125	47	34	98	74	164	81	8	53		2429
Rusty Blackbird												3
Common Grackle	52	173	154	38	347	298	631	101	79	138	20	5132
Boat-tailed Grackle							22			10		37
blackbird sp.		6										38
Ovenbird	25	43	26		12	20	58	22		48	1	789
Worm-eating Warbler	5	6	6		1	1	19		1	16	1	123
Louisiana Waterthrush	3	7	2		3	4	2	4		13	3	175
Northern Waterthrush	1		1		5					1	3	72
Louisiana/Northern Waterthrush												7
Golden-winged Warbler												6
Blue-winged Warbler	1		1									37
Lawrence's Warbler (hybrid)												1
Black-and-white Warbler	10	15	25	1	28	8	25	6		14	3	511
Prothonotary Warbler	1				4	1	6	5		22	5	115
Tennessee Warbler												15
Nashville Warbler			2									49
Mourning Warbler												1

Species	CH	CT	SM	KE	QA	TA	DO	CN	WI	WO	SO	Total
Kentucky Warbler	1	5	1		7	2	2	3		3		45
Common Yellowthroat	16	59	63	2	57	22	139	14	3	37	2	1467
Hooded Warbler	8	14	7				1			2		83
American Redstart		13	15	3	3	1	13	1		10		633
Cape May Warbler	2	2	4		2							114
Cerulean Warbler												42
Northern Parula	33	51	26	3	15	5	25	10	4	15	5	875
Magnolia Warbler		7	2	1	1							91
Bay-breasted Warbler												13
Blackburnian Warbler	1			1								46
Yellow Warbler	2	4	20	1	10	3	6	1		7		449
Chestnut-sided Warbler		1	1	1	1				1			218
Blackpoll Warbler		4	11		2							42
Black-throated Blue Warbler	6	16	13		2	2	15	1	1	1		439
Palm Warbler		2	1									90
Pine Warbler	9	8	30	3	8	21	88	4	4	35	4	276
Yellow-rumped Warbler	17	18	28	13	81	20	32	5	5	2		2045
Yellow-throated Warbler	9	5	6		3	1	4		1	15	3	88
Prairie Warbler	10	2	9			2	17		1	12		180
Black-throated Green Warbler	2	4	2		1							267
Canada Warbler		2	1				1					51
Wilson's Warbler			2			1	1					58
warbler sp.		3		4	4							25
Summer Tanager	12	10	11		3	9	50		1	25	6	149
Scarlet Tanager	20	40	12	4	17	11	10	5	1	6	2	618
tanager sp.		1										3
Northern Cardinal	89	276	165	63	162	157	201	148	48	59	7	7712
Rose-breasted Grosbeak	6	13	3		3	1		4		1		388
Blue Grosbeak	6	11	25	5	17	19	50	10	2	9	1	273
Indigo Bunting	30	51	30	7	41	40	62	39	2	27		1213
passerine sp.	1				2							9

ACKNOWLEDGMENTS

My thanks to Gabriel Foley (Atlas Coordinator, Maryland-District of Columbia BBA3) for providing the eBird data, and to John McKitterick (then Vice President, MOS) for collating and editing the eBird and MOS data, including accounting for duplicates that arose from observers reporting under both systems.

Maryland Birdlife 70(1):81–88

2020 Maryland Fall Count

Charles R. Stirrat

13318 Hunt Ridge, Ellicott City, Maryland 21042-1155
Stirrbird@outlook.com

The annual Maryland Fall Count is held on the third weekend in September with the choice of Saturday or Sunday at the discretion of the county and/or compiler. In 2020, data from 13 of Maryland's 23 counties were compiled. Six counties conducted organized counts on 19 September, five counted on 20 September, and the author compiled eBird data for two more counties that did not organize counts but had widespread coverage on 19 September (Table 1). Having results for thirteen counties is average participation for Fall Count. For several counties, this seasonal count has been a long-held tradition, with this year being the 30th count for Allegany, 27th for Howard, and 25th for Dorchester.

This was the second seasonal count conducted since the on-set of the COVID-19 pandemic. Unlike the 2020 Maryland May Count format that was dramatically impacted by lockdown restrictions, this count was conducted with fewer restrictions and was more consistent with historical norms. Party sizes were generally smaller, participants adhered to social distancing, and no in-person tallies were held.

Table 1: 2020 Maryland Fall Count: participating counties, county codes, survey dates, and compilers.

County	Code	Survey Date	Compiler
Allegany	AL	20 September 2020	Chuck Hager
Washington	WA	19 September 2020	Doris Berger
Carroll	CA	19 September 2020	Scott Hodgdon
Howard	HO	19 September 2020	Mike McClure, Chuck Stirrat
Montgomery	MO	19 September 2020	eBird Tabulation (Stirrat)
Baltimore	BA	19 September 2020	eBird Tabulation (Stirrat)
Prince George's	PG	20 September 2020	Fred Fallon
Calvert	CT	20 September 2020	Sherman Suter
Caroline	CN	19 September 2020	Debby Bennett
Talbot	TA	20 September 2020	Ron Ketter
Dorchester	DO	19 September 2020	Harry Armistead
Somerset	SO	20 September 2020	Pat Valdata
Wicomico	WI	19 September 2020	Paul Bystrak

The weather varied over the extent of the state and from Saturday to Sunday, but the difference was not dramatic. Temperatures were in the high 30s °F to low 40s °F pre-dawn, with one report of a patch of frost in a low point in Howard. Mid-morning temperatures were in the mid to high 40s °F. Afternoon temperatures were in the mid to high 60s °F both days. Winds for all counts west of the Chesapeake Bay were generally light. Counts on the Eastern Shore were reported as windy with winds as high as 25 mph (40 km/h) from the NNE. Cloud coverage was quite consistent across the state with mostly clear skies both mornings across the state and west of the Bay in the afternoon. On both days, increasing clouds characterized afternoons on the Eastern Shore both days. There were no reports of precipitation either day. A number of reports referred to the day as a nice fall day.

A total of 293 field observers in 204 parties turned up 204 species and 75,443 individual birds (Table 2) compared to averages of 194.7 species and 63,937 individuals for the prior seven counts. They spent a total of 588.4 hours and covered 459.1 mi (738.9 km) on foot and spent 75.5 hours stationary. Birders spent 226.0 hours and 1911.9 mi (738.9 km) birding by car. Two parties traveling by other modes (bicycle, golf cart) covered 4.5 mi (7.2 km) in 2.3 hours. Participants in 10 counties reported spending 26.2 hours traveling 66.3 mi (106.7 km) while owling. Feeder watchers spent 37.3 hours. With pandemic concerns, a much smaller Youth Maryland Ornithological Society (YMOS) party (3 youths and 2 adults) counted in Dorchester County. This marked at least nine years in a row a YMOS group has participated. This year's effort (party-hours) is 135% of the average of the prior seven counts and a new high.

There was only one write-in species reported. An American Avocet was found in two counties. One was reported in Dorchester by Harry Armistead and Bettye Maki. A second was reported by Mike Walsh in Wicomico (Figure 1). American Avocet had occurred only once before in the prior seven counts. Single individual species found during the count statewide included Ross's Goose (Dorchester), Mute Swan (Somerset), Canvasback (Carroll), Black-billed Cuckoo (Prince George's), King Rail (Dorchester), Common Gallinule (Dorchester), American Oystercatcher (Dorchester), Stilt Sandpiper (Dorchester), American Woodcock (Caroline), Wilson's Snipe (Howard), Lesser Black-backed Gull (Calvert), American Bittern (Allegany), Yellow-crowned Night-Heron (Calvert), Willow Flycatcher (Carroll), Brown Creeper (Carroll), American Pipit (Wicomico), Clay-colored Sparrow (Prince George's), Dark-eyed Junco (Baltimore), and Boat-tailed Grackle (Dorchester) (Table 3). The Ross's Goose, Canvasback, Clay-colored Sparrow, and Dark-eyed Junco were the first time these species were found in the last eight counts. The two Pine Siskins (Washington) were the first in the last eight counts and an early precursor of an irruption year that was soon to follow.

Table 2. 2020 Maryland Fall Count: summary.

	AL	WA	CA	HO	MO	BA	PG	CT	CN	TA	DO	SO	WI	Total
Total Species	92	61	116	126	94	121	129	126	94	125	155	88	68	204
Total Birds	3553	1871	6182	11,683	2198	7322	8130	4168	5363	5935	15,431	2866	741	75,443
Start Time	0701	0500	0600	0536	0629	0644	0522	0615	0430	0310	0330	0630	0630	0310
Stop Time	0430		1945	2000	2133	1839	1934	1957	1930	1900	1930	1900	2000	2133
Parties	9	3	18	57	22	22	16	10	9	13	15	6	4	204
Individual People	11	5	32	62	35	29	27	14	17	22	27	7	5	293
Hours Driving	43.7	16.0	20.4	29.4			12.1	3.8	22.0	10.4	54.0	13.7	0.5	226.0
Miles Driving	164.2	130.0	270.5	326.7			67.9	31.8	202.0	125.5	496.0	95.3	2.0	1911.8
Hours Walking	19.7	1.0	10.6	174.4	39.3	52.9	83.2	40.8	33.5	51.3	64.0	5.0	12.7	588.4
Miles Walking	18.2	2.0	57.1	123.0	28.9	47.4	52.0	33.4	22.5	32.3	29.0	4.0	9.3	459.1
Hours Other							1.3		1.0					2.3
Miles Other							4.0		0.5					4.5
Stationary Hours	4.0		11.3	13.0	0.2	9.7	10.3	7.7	3.0	0.0		5.8	10.5	75.5
Feeder Hours	7.0		9.5	10.3			5.2			1.0		0.3	4.0	37.3
Hours Owling	0.3	1.0	7.2	1.3	0.7		2.0		1.3	3.4	8.0		1.0	26.2
Miles Owling	0.0		0.8	1.5	0.0		1.7		5.0	10.3	47.0		0.0	66.3

The following highlights were noted by compilers and the author. In total there were 22 species with new highs more than 50% above the high in the seven prior counts (ignoring new highs where a species was infrequent, i.e., observed in less than 5 years). In part, this is due to adding the eBird counts from Baltimore and Montgomery. The most dramatic new high was the number of Broad-winged Hawks (4775) as it includes the results from the hawk watch held at Cromwell Valley (3572). At the time this was the highest Broad-winged Hawk flight at Cromwell Valley since 2014, but amazingly it was followed on the next day with the second highest flight ever with over 8000 Broad-wingeds. Another indication of this being an irruption year for northern specialties was the 60 Purple Finches which greatly exceeded the prior high (5) in the preceding seven years.

Figure 1. American Avocet, *Recurvirostra americana.* Nonbreeding plumage; Porter Road, Wicomico County, Maryland; 19 September 2020; photographed by Marcia Balestri.

In contrast only two species exhibited new lows more than 25% less than the prior low in the previous seven counts, namely Wilson's Snipe (new 1, prior 6) and Great Black-backed Gull (new 252, prior 352).

There were 35 species that were observed in only one county. Fourteen of these were observed in Dorchester County, with the rest being 4 in Prince George's; 3 in Allegany and Carroll; 2 in Howard, Calvert, Caroline, and Somerset; and 1 in Washington, Baltimore, and Wicomico. Thirty species were reported in all 13 counties.

Thank you to all participants and especially the compilers. I urge more participants to enjoy the experience and join in one of the 2021 counts that will be held on 18 or 19 September. I hope additional counties will have volunteers who choose to organize a count in the future and reverse the trend of decreasing interest and participation in organized seasonal counts. Hopefully by then things will have returned to normal and thoughts of social distancing and masks will be behind us.

Table 3. 2020 Maryland Fall Count: observed species.

Species	AL	WA	CA	HO	MO	BA	PG	CT	CN	TA	DO	SO	WI	Total
Ross's Goose											1			1
Canada Goose	169	76	748	869	160	131	548	206	179	524	1277	311	25	5223
Mute Swan												1		1
Wood Duck	8		3	33	6	11	48	8	20	1	57			195
Blue-winged Teal			6			2	2	16			111			137
Northern Shoveler											8			8
Gadwall											2			2
Mallard	28	98	41	73	34	141	158	32	22	17	161	48	1	854
American Black Duck				4							25	5		34
Green-winged Teal	205		3								28			236
Canvasback			1											1
Common Merganser	7													7
Ruddy Duck											5			5
Northern Bobwhite									4					4
Wild Turkey	6	4					1	6	34	3	4	8	4	70
Pied-billed Grebe											1	2		3
Rock Pigeon	122	18	108	63		38	46		44	30	2	133	25	629
Mourning Dove	86	72	209	443	35	58	285	90	139	105	122	17	18	1679
Yellow-billed Cuckoo	1	1	13	7	1	2	14			3	3			45
Black-billed Cuckoo							1							1
Common Nighthawk			8		2					1				11
Chimney Swift	2	1	24	160	106	179	164	2	36	6	1			681
Ruby-throated Hummingbird	25	3	14	16	8	11	22	10	29	38	19	5	8	208
Clapper Rail											6	1		7
King Rail											1			1
Virginia Rail							1				14	1		16
Sora							4							4
Common Gallinule											1			1
American Avocet											1		1	2
American Oystercatcher											1			1
Black-bellied Plover											3		1	4
American Golden-Plover							4							4
Killdeer	7		24	35	42	2	40	15	109	14	91	1	2	382
Semipalmated Plover			1					1			19	2	7	30
Ruddy Turnstone											2			2
Stilt Sandpiper											1			1
Sanderling											8			8
Dunlin											38			38
Least Sandpiper			1	2				1			33		11	48
White-rumped Sandpiper											2			2
Pectoral Sandpiper				1	1						31		10	43
Semipalmated Sandpiper				1							106			107
Short-billed Dowitcher			2								1			3
American Woodcock									1					1
Wilson's Snipe				1										1
Spotted Sandpiper				1		3					3	2		9
Solitary Sandpiper				3										3
Lesser Yellowlegs			4			1					36	6		47
Greater Yellowlegs			1					2			28	28		59
Laughing Gull						33	254	263	12	441	1721	380	200	3304
Ring-billed Gull						102	98	90	182	40	95	3		610
Herring Gull						9		88		32	272	463	12	876

Species	AL	WA	CA	HO	MO	BA	PG	CT	CN	TA	DO	SO	WI	Total
Lesser Black-backed Gull								1						1
Great Black-backed Gull						3		160		2	84	3		252
unidentified gull								1	62	1	14	32		110
Caspian Tern						116	1	4		11	65	5		202
Common Tern						1				4	2			7
Forster's Tern							6	60		71	348	44		529
Royal Tern						11	2	21		5	114	6		159
Caspian/Royal Tern								3						3
Black Skimmer												116		116
Double-crested Cormorant			2	11	5	89	19	141	13	210	278	139	1	908
Brown Pelican										2	219	5		226
American Bittern	1													1
Great Blue Heron	3	3	17	23	6	18	15	22	13	35	52	19	2	228
Great Egret			2	4		12	2	2		7	115	26		170
Snowy Egret						3		14		13	36	16		82
Little Blue Heron						2		3			1	2		8
Tricolored Heron											9			9
Cattle Egret										15	7			22
Green Heron	2		4	8	8	3	6	1	2	2	2			38
Black-crowned Night-Heron					1		1	2		1	1			6
Yellow-crowned Night-Heron								1						1
Black Vulture	15	14	57	188	19	32	104	89	89	38	46	4	31	726
Turkey Vulture	83	12	116	263	42	48	76	141	205	144	317	109	16	1572
Osprey				5		10	1	21	3	18	25	3		86
Northern Harrier				2		2	3		2	2	12	4		27
Sharp-shinned Hawk	3		5	6		31	3	1	1	15	30	2		97
Cooper's Hawk	1	1	5	13	6	11	13	1	6	4	14	3	1	79
unidentified *Accipiter*									1	3				4
Bald Eagle	6	1	10	29	3	32	20	54	18	42	148	18	6	387
Red-shouldered Hawk	5	3	12	79	15	21	31	12	13	3	7			201
Broad-winged Hawk	42		4	849	245	3602		1		5	27			4775
Red-tailed Hawk	9	5	33	21	2	14	26	3	9	10	19	4		155
unidentified *Buteo*					1	1	1		2					5
Barn Owl							1	1						2
Eastern Screech-Owl			2	1			1	1	4	8	16		2	35
Great Horned Owl	1			3				1	2	8	4		3	22
Barred Owl	2	2	3	9	2	1	4	10	6	2			1	42
unidentified owl											1			1
Belted Kingfisher		3	8	22	1	4	7	10	7	5	9	2		78
Red-headed Woodpecker			11	12			3	2		1	12	1		42
Red-bellied Woodpecker	15	11	107	222	30	35	79	74	46	39	36	5	9	708
Yellow-bellied Sapsucker			1			2	3	1						7
Downy Woodpecker	24	5	82	145	25	38	63	54	25	30	44	6	4	545
Hairy Woodpecker	5		10	24	5	8	12	15	3	2	5		1	90
Northern Flicker	35	4	36	94	26	48	47	39	15	78	69	7		498
Pileated Woodpecker	8	5	17	37	8	6	23	13	8	20	10	3	4	162
American Kestrel	1	3	12	13		38	39	3	16	11	64	1		201
Merlin			1			3	4		1	1	3			13
Peregrine Falcon						1	1				1			3
Great Crested Flycatcher	3		1	2	2	4		5	2	3	5			27
Eastern Kingbird		1		1			1			1	1	1		6
Olive-sided Flycatcher	1		1				1							3
Eastern Wood-Peewee	19	2	49	70	18	50	42	33	13	13	14	1		324
Yellow-bellied Flycatcher			10									1		11
Acadian Flycatcher	1		4	1	3	3	3	12	2					29
Willow Flycatcher			1											1

Species	AL	WA	CA	HO	MO	BA	PG	CT	CN	TA	DO	SO	WI	Total
Trail's Flycatcher				1	1		4							6
Least Flycatcher	2		3	1		5	3	3	1	1	1			20
unidentified *Empidonax*			2	5	2	1	2	1	4	2	2			21
Eastern Phoebe	35	14	17	47	8	15	29	9	6	6	4	3	1	194
White-eyed Vireo			4	8	3		4	23	4	1	5		3	55
Yellow-throated Vireo			5	4	2	2	2	4			1			20
Blue-headed Vireo	10		2	4	1	2	2	1		1				23
Philadelphia Vireo				3	1	3				1				8
Warbling Vireo				1	2	4	2							9
Red-eyed Vireo	17	13	52	74	34	56	59	51	17	16	18	1	2	410
Blue Jay	95	78	363	713	92	363	554	112	117	392	159	20	35	3093
American Crow	78	23	331	443	51	79	479	124	93	131	196	51	24	2103
Fish Crow		15	1	168	1	5	65	27	14	14	6	6	4	326
unidentified crow			1	322	44	2	18	4	40	41	60	51		583
Common Raven	17	2	12	10			6							47
Horned Lark			20		5				20	5	2		11	63
Tree Swallow	1	32	73	4	219	31	4		519	75	2732	8		3698
N. Rough-winged Swallow			3		1		10							14
Barn Swallow			6	2			9		29		8			54
Carolina Chickadee		12	71	175	44	70	105	104	88	95	185	15	22	986
Black-capped Chickadee	34													34
Tufted Titmouse	9	21	40	141	26	56	68	108	56	98	89	5	11	728
Red-breasted Nuthatch		1	14	15	2	10	10	11	2	61	46	2	4	178
White-breasted Nuthatch	32	13	78	128	29	31	39	50	26	17	6	2	1	452
Brown-headed Nuthatch								8		20	106	12		146
Brown Creeper			1											1
House Wren	6	1	15	23	7	18	9	9	2	9	8	1	5	113
Winter Wren						1		1		1				3
Marsh Wren				1				1			1	2		5
Carolina Wren	34	21	152	334	53	75	192	175	80	144	123	17	23	1423
Blue-gray Gnatcatcher	3		11	4	1	7	5	6	5	26	40	3	1	112
Ruby-crowned Kinglet	5			2		3	5	3		3	2			23
Eastern Bluebird	17	13	123	318	16	19	93	108	67	148	171	11	9	1113
Veery			2	1	1	6	1	3	1	1	5			21
Gray-cheeked Thrush	1		2	1		2	1		1					8
Swainson's Thrush			24	17	11	10	5	3		5				75
Wood Thrush	1	2	36	6	3	8	4	5		1		2		68
American Robin	43	78	168	436	64	138	139	29	319	54	59	1	19	1547
Gray Catbird	36	30	199	318	62	110	161	49	9	31	39	3	9	1056
Brown Thrasher	5		13	14	4	22	19	27	8	17	10	4	6	149
Northern Mockingbird	8	5	46	95	16	13	69	31	45	74	44	15	14	475
European Starling	1476	700	865	1360	74	188	1667	207	1548	775	1760	335	17	10972
Cedar Waxwing	103	12	17	93	7	89	107	5	7	11	55			506
House Sparrow	149	29	110	132	31	30	111	121	81	22	48	7	8	879
American Pipit													1	1
House Finch	35	37	134	171	8	12	50	42	38	26	8	12	12	585
Purple Finch	2	2	16	5	14	13	3				5			60
Pine Siskin		2												2
American Goldfinch	109	25	164	434	60	43	165	75	84	56	81	9	19	1324
Grasshopper Sparrow				2			4			1		1		8
Chipping Sparrow	35		136	207	2	3	79	42	70	57	74	18	18	741
Clay-colored Sparrow							1							1
Field Sparrow	5		9	12		1	4	2	6	5	1	5	1	51
Dark-eyed Junco						1								1
White-throated Sparrow						3		1		1	1			6
Seaside Sparrow											2	4		6

Species	AL	WA	CA	HO	MO	BA	PG	CT	CN	TA	DO	SO	WI	Total
Savannah Sparrow				10		6	21			3	3			43
Song Sparrow	19		14	34	1	5	16	24	3	4	4	6		130
Lincoln's Sparrow						3	3							6
Swamp Sparrow					1			1				1		3
unidentified sparrow			9	9			1		9	6				34
Eastern Towhee	12	6	33	47	5	3	12	19	2	2	7			148
Yellow-breasted Chat				1				1						2
Bobolink								3	13	26	440			482
Eastern Meadowlark	23		2	3			22	2	2	6	8	1		69
Baltimore Oriole		1		1	1			1						4
Red-winged Blackbird			2	57	31	17	225	127	15	214	1438	21	7	2154
Brown-headed Cowbird		77	2	194		2	274	44	194	659	55	150	3	1654
Common Grackle	4	210	516	185	32	74	229	55	59	12	8	31		1415
Boat-tailed Grackle											1			1
unidentified blackbird			40							47				87
Ovenbird	3	7	6	6	2	16	2	4	1	1	4	2	1	55
Worm-eating Warbler	3		2											5
Northern Waterthrush				1		2	3	2	1	1	1			11
Blue-winged Warbler				1	1					1				3
Black-and-white Warbler	4		11	38	14	40	29	21	12	23	62		1	255
Tennessee Warbler	4		4	7	2	6	3	1		1	2			30
Nashville Warbler	1		2	2		4		1		1	1			12
Connecticut Warbler			2			1	3	1						7
Mourning Warbler				1			1							2
Common Yellowthroat	7		23	67	35	64	62	63	4	21	35		4	385
Hooded Warbler	1					1								2
American Redstart	5		13	53	15	61	49	27	43	68	146	4	8	492
Cape May Warbler	4		4	6	5	2	3	3		4	5		1	37
Northern Parula	1	1	16	40	15	44	40	12	27	37	51		3	287
Magnolia Warbler	6		27	58	19	56	47	7	2	9	10			241
Bay-breasted Warbler		1	6	10	5	18	2	1	1		4		1	49
Blackburnian Warbler	1		1	10	11	12	2		2	2	3			44
Yellow Warbler	1			1		2		3		5	6		1	19
Chestnut-sided Warbler	3		4	16	7	49	12	1		4	6			102
Blackpoll Warbler			2	2		6		1		1	6			18
Black-throated Blue Warbler	2	1	10	23	14	15	5	8	1	2	12			93
Palm Warbler			1	6			8	7		3	10			35
Pine Warbler	1		1	6	1	3	12	10	8	19	104	4	6	175
Yellow-rumped Warbler				8	2	5	5	5	5	8	14			52
Yellow-throated Warbler			1	2				1		1				5
Prairie Warbler				2		1	1				5			9
Black-throated Green Warbler	7	4	15	57	18	62	18	4		2	1			188
Canada Warbler	4			3		2					1			10
Wilson's Warbler	1						2							3
unidentified warbler				33	1	2	1		7					44
Summer Tanager							2	1		1	5	2	1	12
Scarlet Tanager	8	1	4	13	2	12	9	5	1	2	1			58
Northern Cardinal	64	30	221	457	76	120	218	183	109	125	109	13	14	1739
Rose-breasted Grosbeak	8	3	13	13	10	20	33	10	1	3	6			120
Blue Grosbeak				7	1		11	12	21	20	37		2	111
Indigo Bunting	2			69	1	10	22	49	13	6	30		2	204
Total Birds														**75,443**

MARYLAND BIRDLIFE

NOTICE TO CONTRIBUTORS

Contributors should prepare manuscripts according to the following instructions.

Title: The title should be brief, concise, and pertinent.

Abstract: An abstract is required for all long articles; suggested for all biologic studies more than two (2) pages in length; but is not needed for notes, distribution reports, or short observations (especially if two pages or shorter in length). The abstract should provide a capsule description of the main thrust, methods, and essential findings of the article. It should contain the scientific name of the main subject species.

Text: Manuscripts should be double-spaced, lines numbered, and submitted in MS Word™ by e-mail. Please identify respective file name(s) for text, figure titles, and descriptions of graphs or figures. First mention of a biological organism, in the abstract and text should include the full scientific name in italics. Carefully check the spelling of all scientific names. Capitalize the first letter of each word comprising the "official" common name for faunal species. Short articles and general notes (20 pages or less) are preferred. Camera-ready, color illustrations, pictures, or digital images are preferred.

References: References should be given in an author-date format: (Robbins 1987); (Robbins 1987, 1988); (Robbins, in press); (Robbins, in litt.); (Robbins, pers. comm.); (Robbins and Robbins 1987); and (Robbins et al. 1987) for three or more authors. Provide evidence of acceptance for works "in press," or cite as "unpublished", "in litt." (written), or "pers. comm." (verbal), written permission is suggested as well. Citations shall be listed alphabetically, under LITERATURE CITED, as follows: **Articles**: Robbins, C.S. 1965. New breeding bird survey tested in Maryland this summer. *Maryland Birdlife* 21(2):48–49. Do not abbreviate the titles of journals. **Books**: Ellison, W.G. (Editor). 2010. *2nd Atlas of the Breeding Birds of Maryland and the District of Columbia*. The Johns Hopkins University Press, Baltimore, MD. 494 pp. **Internet**: Holt, D.W., M.D. Larson, N. Smith, D.L. Evans, and D.F. Parmelee. 2020. Snowy Owl (*Bubo scandiacus*), version 1.0. In Birds of the World (S.M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY; Available at: https://doi.org/10.2173/bow.snoowl1.01. Accessed 7 March 2021.

Tables: Tables, graphs, and line drawings should be created electronically in black and white. Color should only be used when absolutely necessary for clarity.

Illustrations: Photographs or high-definition images may be accepted if necessary or desired by the author(s) to support the text. Photographs should be submitted in color. Figure numbers, as cited in the text, and figure legends should be keyed to each respective photograph.

Maryland Birdlife is published twice annually to record and encourage the study of birds in and around Maryland. ***Maryland Birdlife*** contains original articles, notes, and research papers primarily pertaining to Maryland and the Mid-Atlantic region. Potential topics may include geographic or temporal distribution, ecology, biology, morphology, systematics, behavior, migration, life history, as well as other biological topics. Annual bird counts also will be published. All submissions are subject to editorial review and acceptance. Articles and research papers will be peer-reviewed. Please e-mail submissions to Editor Eugene J. Scarpulla at birdlife@mdbirds.org.

Maryland Ornithological Society, Inc.
4915 Greenspring Avenue
Baltimore, MD 21209

Maryland Birdlife
Published Semiannually by the Maryland Ornithological Society, Inc.

Editor: Eugene J. Scarpulla, 14207 Lakerun Court, Bowie, MD 20720-4861
birdlife@mdbirds.org
Associate Editor: Mark S. Johnson, 3204 Bryson Court, Baldwin, MD 21013
MarkSJohnson2@gmail.com

CONTENTS – SPRING 2021